IDG.net Science strains silicon to uphold Moore's Law. PAGE 60 ▪ Privacy regs take hold in health care, financial services. PAGE

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AUGUST 13, 2001 ▪ VOL. 35 ▪ NO. 33 ▪ $5 COPY

ERIC YANG

Crashing The Party

The 20th anniversary of the introduction of the IBM PC is a fine time to reflect on the progress and direction of personal computing. But when all the hoopla dies down, IT managers will still have to deal with reliability issues associated with the dreaded PC crash — problems that won't go away in the foreseeable future.

Our coverage begins on page 16.

NEWSPAPER

MICROSOFT MCSE TRAINING FAULTED

Lack of focus on security in professional training seen as factor in spread of viruses

BY DAN VERTON

IT professionals and trainers are blaming insufficient security training offered under the nationwide Microsoft Certified Systems Engineer program for contributing to the spread of Code Red and other damaging viruses.

CODE RED UPDATE

In an e-mail newsletter sent out last week to its 96,000 members, the Bethesda, Md.-based SANS Institute, a research and education organization for systems administrators, urged MCSEs to take a free class offered by the institute on how to reconfigure and patch Windows-based systems against the vulnerabilities exploited last month by the Code Red worm. The core courses required to attain MCSE certification don't provide the level of security training engineers need to protect their systems, according to SANS Institute officials and other industry experts.

MCSE trainers and students contacted by *Computerworld* last week said they agree with the organization. Most noted that while basic security is covered as part of the Microsoft Official Curriculum for MSCE certification, in-depth security training is optional and not a core requirement.

The shortfalls in MCSE training are "one of the root causes of lax security in the private sector," said Keith Morgan, chief of information security at Terradon Communications Group LLC, a Nitro, W.Va.-based network security services company.

"Every MCSE that comes through our door has to be quizzed on his level of security understanding," said Morgan. "Most of them have to be trained in even the most basic of security principles. It costs us time and money."

MCSE Training, page 14

TVA'S NEW DEAL: PUBLIC/PRIVATE B2B

Unified supply chain key to staying competitive

BY MICHAEL MEEHAN
CHATTANOOGA, TENN.

By law, the Tennessee Valley Authority can't sell the 165 billion kilowatt-hours of electricity it generates each year beyond a designated seven-state area. But competitors can come into those states and take business away from the government-owned company.

To fight back, the nation's largest wholesale producer of electricity is launching a bold new e-commerce strategy that combines private and public business-to-business marketplaces with a unified supply chain asset-management system that was installed in a multiyear project.

The Knoxville, Tenn.-based TVA plans to use a private marketplace that went live in June to service the 158 local power companies that distribute its electricity, while pushing internal procurement activities and purchases made on behalf of the distributors through a public exchange that

TVA, page 77

STILL HOPE FOR IT JOB SEEKERS

Energy, retail, finance offering opportunities

BY JULEKHA DASH

Although recent layoffs and economic figures signal a gloomy outlook for IT job seekers, some candidates may find a few bright spots if they concentrate their job hunts in the right places.

Within segments of certain industries — such as oil and gas, retail and financial services — employers are still eager to attract IT talent.

With resource-intensive supply chain and customer relationship management projects

IT Jobs, page 10

By the Numbers

- ▸ The total number of job cuts across all U.S. industries this year is **983,337**.
- ▸ Job cuts for all of last year totaled **613,960**.
- ▸ The previous high was **677,795** cuts in 1998.

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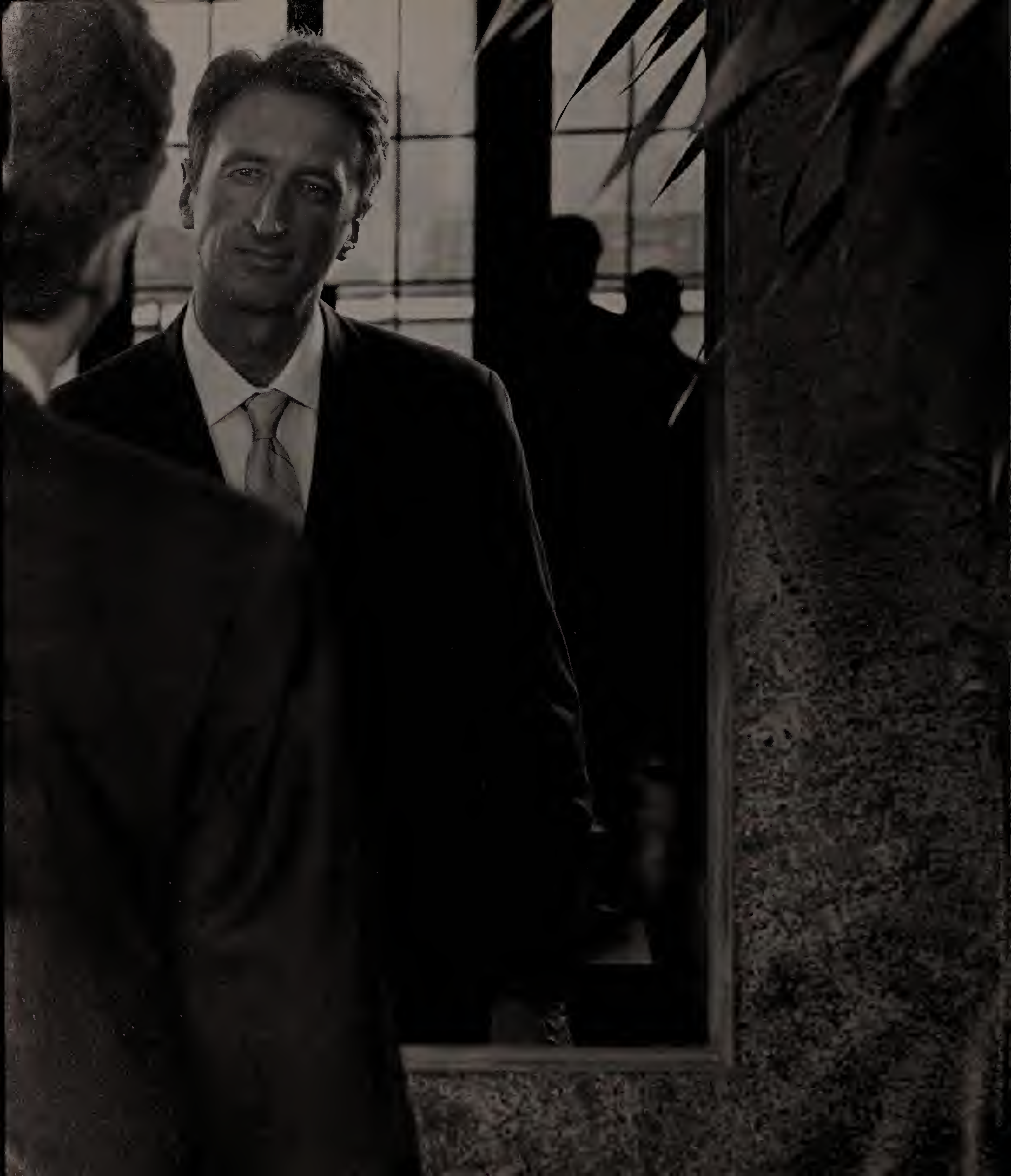

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DANNY TURNER

THE H-1B TURNSTILE

With the economic downturn leading to high-tech layoffs, many H-1B workers are being forced to leave the U.S. while thousands of new, untrained workers continue to arrive, according to IT leaders like Abid Adebi. **PAGE 43**

MARC BERLOW

REMOTE SUPPORT

Keeping remote offices up and running is a challenge for any IT department. Experts like Jayco's Dave Nijak offer tips. **PAGE 56**

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8 Researchers at Rice University and AT&T Labs find new flaws in wireless LAN security.

10 Federal IT workers get some support in their quest for higher pay.

12 NIPC Director Ronald Dick provides a behind-the-scenes look at how the government organization handled the Code Red epidemic.

14 Code Red II threatens systems even after Microsoft patches are installed.

Quick Link

For breaking news, updated twice daily at noon and 5 p.m., visit the *Computerworld.com* Web site:

www.computerworld.com/q?q4000

BUSINESS 45

45 If you're responsible for a large IT/business project, it would be wise to get your attorneys involved as business partners, writes Ed Yourdon.

48 Duke Energy set a team of nomadic e-business visionaries loose throughout the company to help seed pilot projects and assist with implementations, helping save the company more than $52 million last year.

50 A fiduciary is a person whose job involves earning the confidence or trust of a company's customers. That can apply to anyone who provides services to customers, including IT workers.

52 Joe Auer urges IT buyers to take steps to avoid vendors' "gotchas" when they want to sublease equipment as part of a deal.

TECHNOLOGY 55

55 E-mail encryption must get a lot less complicated before it can become a widespread practice, says reviews editor Russell Kay.

58 ACM CEO John White discusses where IT and his organization are heading.

60 Future Watch: Strained silicon could increase semiconductor speeds by 35%, developers say.

62 Security Journal: Security manager Mathias Thurman takes home some surprising lessons from the famous Def Con hackers' conference in Las Vegas, where he learned both how to attack his systems and how to protect them.

64 Emerging Companies: Parabon Computation's Frontier software allows companies to redirect unused CPU cycles on desktop PCs toward heavy-duty number crunching.

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26 Mark Hall theorizes that IT is finally being recognized for its real impact on business.

26 Pimm Fox says Microsoft's .Net strategy has its advantages for IT organizations. But will developers follow?

27 David Foote writes that laying off workers is painful, but there are plenty of ways you can ease that pain.

28 Thornton May says the IT "message" is coming from vendors and analysts, and it's about time that IT leaders seize the microphone.

78 Frank Hayes reminds us that it wasn't the PC that changed the IT world. It was the users.

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ONLINE

TECH HISTORY

After reading about the 20th anniversary of the IBM PC, head to our Flashback page for a history of the computer industry.
www.computerworld.com/q?z1000

WATCHING YOUR WEB SITE

Finding the right analytics package is an important first step to discovering what your customers are doing and why.
www.computerworld.com/ecommerce

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AT DEADLINE

NSF to Fund $53M Linux Computing Grid

The National Science Foundation in Arlington, Va., said it plans to fund a $53 million project to build a supercomputing grid linking Linux-based systems at four research and academic institutions.

The grid will use IBM servers based on Intel Corp.'s Itanium processor and will be connected via a high-speed optical network. It's scheduled to be operational by the middle of next year and to reach peak performance levels in 2003.

Red Hat Readies E-Commerce Software

Red Hat Inc. in Research Triangle Park, N.C., announced an open-source suite of e-commerce software aimed at midsize companies. The offering is based on Red Hat's version of Linux and its new open-source database, plus technologies such as the Apache Web server and Interchange e-commerce engine. The applications are due to start shipping this month.

Corrections

The Emerging Companies profile of ProSight Inc. that appeared in our July 30 issue listed an incorrect founding date. The correct date is November 1998.

In "Making Active Directory Easier" [Technology, Aug. 6], FastLane was misidentified as a Microsoft Corp. product. The correct vendor is Quest Software Inc. in Irvine, Calif.

The story "Dimmed Utilities Plug Into CRM" [Page One, Aug. 6] incorrectly stated that PG&E Corp. has been under bankruptcy protection for more than a year. It should have stated that Information Management Associates Inc. has been under bankruptcy protection for more than a year; PG&E filed for that protection in April this year.

Microsoft Appeals Case to Supreme Court

Company readying for XP, say some critics

BY PATRICK THIBODEAU
WASHINGTON

Microsoft Corp. last week appealed its antitrust case to the U.S. Supreme Court, a step critics said was taken as a means of delaying the case and clearing the way for the scheduled October release of Windows XP.

The government hasn't said whether it will attempt to block the release of XP, but there are indications that it won't. Trade groups backing the antitrust case against Microsoft maintain that the government will be in a better position to argue for remedies if XP's release is unimpeded.

"The truth is, [Windows XP is] a tremendous Exhibit A," said Ed Black, CEO of the Washington-based Computer & Communications Industry Association, whose members include Oracle Corp. and Sun Microsystems Inc. But, Black argued, a strong permanent remedy is more important.

Moreover, time is short. XP is due to be released to PC makers this month and could appear in stores next month if those vendors disregard Microsoft's official Oct. 25 release date.

Microsoft is asking the high court to throw out the U.S. District Court's ruling because of critical comments made by trial Judge Thomas Penfield Jackson. The U.S. Court of Appeals, in its unanimous June 28 decision, did disqualify Jackson. But Microsoft wants the timing associated with that disqualification to begin with the first instance the judge discussed the case with a reporter.

Jackson's out-of-court interviews with reporters occurred prior to the release of the first part of his two-part decision. If the high court disqualified Jackson from any point prior to the release of his decision, it would essentially be throwing out the case.

But legal experts say the high court is going to give wide latitude to the appeals court. "I don't think the Supreme Court is likely to second-guess the [appeals] court on this issue," said Donald Falk, an attorney at Mayer, Brown & Platt in Palo Alto, Calif.

"Eight federal judges have reviewed this on the merits; there is safety in the conclusion that Microsoft indeed violated the law and that the facts are in many respects not even challenged," said Kenneth Starr, former independent counsel and a former appeals court judge. Starr, now an attorney at Kirkland & Ellis in New York, is advising ProComp, a Washington-based trade group that has been backing the government's case against Microsoft.

The antitrust case was due to be transferred to U.S. District Court last Friday, an action that would have opened the door to remedies. But that transfer was delayed as a result of Microsoft's motion. The appeals court is expected to rule on that stay at any time.

The appeals court, in its June 28 decision, agreed with the District Court that Microsoft used anticompetitive practices to maintain its monopoly, but it rejected a finding that the firm illegally attempted to monopolize the browser market. ◗

Quick Link For more coverage of the Microsoft antitrust trial, visit our Web site.
www.computerworld.com/q?s1100

AT A GLANCE

What's Next?

BIG QUESTION: The government could seek preliminary injunctions against Microsoft. Some legal experts say the fight over Windows XP could distract the parties from a comprehensive remedy.

XP TIME: Although Windows XP isn't officially due to be available until Oct. 25, some PC makers could start selling it beforehand. That has happened with other versions of the operating system.

THROW THE CASE OUT? The Supreme Court isn't likely to decide on Microsoft's request to broaden Jackson's disqualification until late September or early October.

Panel: CIA Venture-Capital IT Firm Off to a Fast Start

In-Q-Tel still faces cultural hurdles

BY DAN VERTON

The CIA's private-sector IT research-and-development firm, In-Q-Tel Inc., faces significant hurdles in breaking through the agency's secretive culture. But by most industry standards, the 2-year-old start-up has "a good track record," according to a report released last week by an independent panel of corporate executives.

The report by the 30-member panel, which was called for by Congress as part of the fiscal 2000 Intelligence Authorization Act, concluded that In-Q-Tel's business model "makes sense." But it stopped short of recommending that the Arlington, Va.-based firm's charter be expanded to include other government agencies.

"It is unrealistic to expect such a venture to have produced strategic change at this point, but In-Q-Tel has achieved significant early progress," the report stated. It added that the firm has made more than a dozen investments and brought five technologies and services to the CIA for use or demonstration. "By private-sector standards, this represents a noteworthy accomplishment," the panel said.

Washington-based think tank Business Executives for National Security managed the work of the panel, whose members included Kenneth Novack, vice chairman of New York-based AOL Time Warner Inc., and Raphael Benaroya, chairman and CEO of Rochelle Park, N.J.-based clothing retailer United Retail Group Inc.

The CIA created In-Q-Tel in early 1999 with $28 million in venture capital and the goal of more rapidly delivering commercial technologies to the intelligence agency. In-Q-Tel CEO Gilman Louie said he was "very pleased" by the panel's report, which credits him with reaching out to technology vendors that didn't do business with the government before.

That has led to an injection of new technologies such as the Presidential Information Dissemination System (PIDS), a briefing tool used by CIA analysts to brief the president-elect during the transition period between administrations. PIDS is also the basis for the CIA's iWeb program, which aims to develop a Web-based portal for groups of analysts. ◗

Still More Work To Accomplish

The independent panel that reviewed the CIA's In-Q-Tel venture said its progress to date has been impressive, but it added that the firm faces the following challenges:

- The process for accepting and implementing new technology at the CIA is a big hurdle for the company.
- It's essential for In-Q-Tel to get improved access to department heads and other key officials at the agency.
- The CIA and In-Q-Tel still need to develop a common set of metrics for measuring the success of the venture.
- In-Q-Tel's business model has to mature before its customer base is expanded beyond the CIA.

Health Groups Urge Feds Not to Delay Changes to Privacy Rules

Industry players seek quick resolution to patient consent and other HIPAA issues

BY JULEKHA DASH

FURTHER DELAYS in modifying the privacy provisions of a new health care law could prove to be a big headache for the industry's IT professionals.

Last week, approximately 80 health care groups sent a letter to U.S. Department of Health and Human Services (HHS) Secretary Tommy Thompson urging him to make changes as soon as possible to the privacy rules the department finalized in April. Those anticipated changes, which Thompson addressed in a guideline he released last month, include modifications to provisions affecting areas such as patient consent and parental rights.

The organizations, including the American Hospital Association (AHA) in Washington and the American Medical Association in Chicago, urged the department "to move as expeditiously as possible to make modifications" to the Health Insurance Portability and Accountability Act (HIPAA) so they will "have adequate time to comply" by the April 14, 2003, deadline.

HHS officials didn't return calls requesting comment.

Unresolved Issues

The HIPAA guidelines Thompson issued last month address areas of concern raised by health insurance plans, hospitals and pharmacies, including patient consent, parental rights, marketing, medical research and governmental access issues.

For instance, the anticipated changes would allow pharmacists to fill prescriptions by phone, even without patients' consent on record. Otherwise, pharmacies would need to adapt their systems to keep consumers' authorizations on file, said Michael Freeman, a spokesman for the Healthcare Leadership Council, a Washington-based coalition of CEOs who signed the letter.

Health care groups don't want to make an "investment in systems and then [see] the rules change along the way," said Freeman.

According to the AHA, hospitals will spend up to $22.5 billion during the next five years to comply with the privacy regulations. Much of that spending will be on IT, according to Melinda Hatton, the AHA's vice president and chief Washington counsel.

In order for IT departments to make sure systems comply with HIPAA, HHS not only needs to be quick in making changes, but it also must be specific in the types of technologies it recommends, said Timothy Bavosi, a systems analyst at Northeast Health Systems in Beverly, Mass.

For instance, the finalized HHS privacy rules state that hospitals should try to protect the privacy of patient information on their networks, but they don't advise what kind of software or protocols to use, said Bavosi. This lack of clarity "leaves the door open for getting in trouble," he said.

Delays in the final privacy rule will likely impact operations more than systems, according to Deborah Green, HIPAA project leader at Atlanta-based Mariner Post-Acute Network Inc.

Green said her organization is coping with the possibility of changes to HIPAA by addressing parts of the rule that are less controversial, such as standardizing contracts and replacing billing systems. ◗

Quick Link For more HIPAA coverage, visit *Computerworld*'s Web site.
www.computerworld.com/q?s1500

Healthy Progress

A time line of the HIPAA privacy rules' development

DECEMBER 2000	APRIL 2001	JULY 2001	AUGUST 2001	APRIL 2003
President Clinton announces the **final privacy rules**	After a comment period, **final privacy rules go into effect**	HHS Secretary Tommy Thompson announces that he **plans to modify the final privacy rules**	**Major health groups send a letter** to HHS urging that any changes be made quickly	**Deadline for compliance** with the HIPAA privacy rules

MORE THIS ISSUE

For our special report on government policies, including privacy, **see page 32.**

AAA Integrates Apps to Resolve Data Glut

Analyzes travel info to target hot spots

BY JENNIFER DISABATINO

AAA, formerly known as the American Automobile Association, has gone live with newly integrated software that enables it to sort and analyze customer data, which the company will use to secure better travel deals for its members.

"We've always had more data than we knew what to do with," said Glen Mac Donell, manager of data management and analysis at AAA's national offices in Heathrow, Fla. "The difference is how to track it."

For years, he said, the 81 independent AAA and Canadian Automobile Association (CAA) clubs have collected customer data through three business-intelligence software products from Cognos Inc. in Burlington, Mass. The three products were linked to the national office by a third-party, custom-built application, but it couldn't track all of the information.

"They didn't work well together. [The previous, proprietary system] didn't really get all the information that we would normally get," Mac Donell said.

Culling the data is nothing new, analysts say. "That's a practice throughout the travel industry," said analyst Kate Rice at online travel researcher PhoCusWright Inc. in Sherman, Conn.

But getting it quickly and accurately is another matter. "The whole challenge is having the right data," Rice noted.

AAA is "behind the eight ball" in terms of culling and analyzing its data, according to Richard Eastman, CEO of The Eastman Group Inc. in San Francisco. "[But] there is an advantage to being behind the curve. An astute business company can recover from having made an incorrect strategic guess, and they can learn from others' experiences," he said.

The automobile association offers travel, insurance, financial and emergency road services to almost 44 million members in North America. The group's travel arm and CAA provide them with information about airlines, hotels, car rental firms, tour companies and cruise lines.

Using integration technology from Cognos partner Sky Solutions LLC in Saddle Brook, N.J., the association can now track how many members it books for a specific hotel and provide data on which locations are most popular. AAA wants to use the data to negotiate better rates from hotels and tourist services for its members by year's end, said Mac Donell. The data will also help the association target its promotional efforts, based on where large numbers of members travel.

Reports generated from Cognos' Impromptu, PowerPlay and DecisionStream software are posted on AAA's intranet. Mac Donell and a few colleagues conduct the business analysis, while the 100-person-plus IT department runs the server.

Previously, AAA outsourced its server and server maintenance. But now it has the server in-house, which makes changes and maintenance easier and cheaper, according to Mac Donell. After Sky Solutions did the initial implementation, it "handed the keys over" to AAA, Mac Donell said, and let him and his colleagues configure the data analysis queries themselves.

Other travel services also use Cognos to analyze customer data. Dallas-based Sabre Holdings Corp. uses it at two of its subsidiaries, Travelocity.com Inc. and GetThere Inc., to sort customer data.

Lebensart Technology Inc., a Scottsdale, Ariz.-based application service provider for the the hospitality and tourism industry, also uses Cognos for its business intelligence. ◗

Potentially Dangerous Wireless LAN Threats Discovered

Researchers: All standard 802.11 wireless LANs should be considered insecure

BY DAN VERTON AND BOB BREWIN

SEVEN MONTHS after researchers at the University of California at Berkeley discovered flaws in the encryption algorithm designed to protect wireless LANs, a different group of experts has uncovered what they say is a new and more dangerous method of attack.

Researchers from Rice University in Houston and AT&T Labs in Florham Park, N.J., published a paper on Aug. 6 outlining a new passive attack that is capable of defeating the 128-bit version of the Wired Equivalent Privacy (WEP) encryption algorithm used to protect 802.11 wireless LANS.

The researchers state in their paper that all industry-standard 802.11 wireless LANs should be viewed as insecure and that users should "treat all systems that are connected via 802.11 as external." They also urge corporate users to "place all access points outside the firewall."

Unlike the Berkeley attack, which required skilled hackers to break the encryption keys, this new attack method "is much stronger and much easier for a generic person to carry out," said Adam Stubblefield, a graduate student at Rice and co-author of the report. "The adversary is completely passive. He can just listen to the network traffic, and the victims will never know they've been compromised."

The new attack method discovered by Stubblefield and Aviel Rubin, a researcher at AT&T Labs, came one week after Scott Fluhrer at Cisco Systems Inc. and Itsik Mantin and Adi Shamir at the Weizmann Institute of Science in Israel published a paper describing the attack in theory. Stubblefield took that paper and, using a $100 wireless LAN card he purchased from Linksys Group Inc. in Irvine, Calif., proved after less than two hours of coding that it was possible to recover the 128-bit secret WEP key used in wireless LANs.

However, Rubin said, it's important to note that generic 128-bit encryption is still secure and that this most recent discovery demonstrates flaws in the way WEP uses the WEP RC4 cipher. "You can take ciphers that use a 128-bit key and design or use them in an unsecure way. In WEP, it's a flawed design," he said.

Though WEP currently uses 64-bit encryption, the industry plans to move to a 128-bit key for additional protection in a standard due later this year.

But, the Fluhrer paper said, existing weaknesses in WEP mean a successful attack can be mounted against "any key size," including "the revisited version WEP2."

John Pescatore, an analyst at Stamford, Conn.-based Gartner Inc., said his company has been telling clients for some time to run virtual private networks to secure wireless LANs. "Treat [wireless] LANs just like you do the Internet. Don't trust the security [that's] built in," Pescatore.

"Some of the vendors, like Cisco, have built in better security than WEP, but Rubin's attack against streaming crypto shows the need to run proven stuff like IPSec or [Secure Sockets Layer]," he added.

Yang Min Shen, senior manager of wireless systems at Symbol Technologies Inc. in Holtsville, N.Y., said his company offers the Kerberos network authentication protocol to fend off the kind of key-sniffing Stubblefield exploited. That attack took advantage of a static key, Shen said, and Kerberos could have deflected it with software that allows the changing of keys as often as every five minutes.

Symbol has a contract to supply wireless LAN hardware to Atlanta-based United Parcel Service Inc. for the world's largest deployment of 802.11 systems. ◗

Quick Link For more wireless news, visit our Mobile/Wireless Knowledge Center. www.computerworld.com/q?k1000

Tulane University Launches $1.7M Wireless Initiative

Eyes easy upgrade to 802.11a standard

BY JAMES COPE

When students at Tulane University in New Orleans return to classes later this month, IT managers at the university hope they will have at least part of a new wireless LAN up and running. The LAN will ultimately employ up to 1,000 wireless access points from Rochester, N.H.-based Enterasys Networks Inc.

Tulane last week announced it had allocated $1.7 million for the wireless LAN project and that 800 Enterasys RoamAbout R2 units were on the way.

The university's vice president of technology, Jed Diem, said he and the director of network services, Tim Deeves, selected the Enterasys RoamAbout R2 access point equipment over two other companies because of the ease of migration.

The university will switch from the current 802.11b industry standard, which runs at 11M bit/sec., to the faster 802.11a standard, which will send data through the air at up to 54M bit/sec. Diem said the Enterasys wireless access point chassis has a dual-slot design. One slot accommodates today's 11b radio card, while the other awaits an 11a card that Enterasys said it will ship by year's end.

The Layer 3 capabilities of the Enterasys product also played a part in the vendor selection, Diem said. The additional functionality, he noted, will allow Tulane to create wireless subnets dedicated to specific categories of traffic that only a given department or set of individuals will be allowed to access.

"If all access points were operating at Layer 2, there could be broadcast traffic that might be seen by others [who should not see it]," Deeves said.

Another Approach

While Enterasys is convinced that dual slots provide a logical migration path from 802.11b to 802.11a, other vendors aren't.

Sunnyvale, Calif.-based Proxim Inc., for example, has elected to place routing and management control for its Harmony wireless LAN series into a separate unit called the Harmony Access Point Controller and has also developed separate 802.11b and 802.11a radio housings instead of putting both in the same chassis.

Galen Schreck, an analyst at Forrester Research Inc. in Cambridge, Mass., said it's too early to say whether one migration approach will be superior to another. A more important issue for IT managers, Schreck noted, is whether a wireless network is warranted at all.

"A university campus makes sense for wireless LANs," said Schreck, "because people are roaming all over the place." But in a company where you have network jacks in conference rooms and other common areas, wireless may be unnecessary, he noted.

According to Diem, the 802.11b radio cards running at 11M bit/sec. will be adequate for student and classroom access to the campus network, but he added that there are applications, such as a foreign-language multimedia application, that are begging for the faster speeds of 802.11a. ◗

THE WIRELESS NETWORK across Tulane's campus will ultimately include 1,000 Enterasys Networks access points.

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BRIEFS

Sun to Resell Hitachi Disk Arrays

Sun Microsystems Inc. plans to resell high-end storage devices made by Santa Clara, Calif.-based Hitachi Data Systems Corp. under a deal announced last week. The two companies also said they will distribute each other's storage software and collaborate on software development work.

Oracle Ships Mobile Releases

Oracle Corp. announced mobile-enabled versions of its business applications for use on wireless devices. The mobile E-Business Suite software is based on Oracle9i Application Server and will initially support application modules for managing field sales and service, finance, supply chain operations and warehouses.

U.S. Military Plans PeopleSoft HR System

Pleasanton, Calif.-based PeopleSoft Inc. said the U.S. Department of Defense plans to install its human resources software to manage personnel and payroll data for about 3.1 million workers in all branches of the military. The Pentagon's PeopleSoft 8 software is due to go live next year, along with companion self-service and workforce-analysis applications.

Netscape Launches Upgraded Browser

Netscape Communications Corp. released the commercial version of a Web browser upgrade that's expected to address the technical problems that have hampered its Netscape 6.0 software. The Mountain View, Calif.-based subsidiary of AOL Time Warner Inc. said the Netscape 6.1 browser was designed to offer improved performance and stability.

Government Pushes to Compete for IT Hires

Retirements threaten services, report says

BY PATRICK THIBODEAU
WASHINGTON

The U.S. government is trying to compete more successfully against the private sector for IT talent, as well as make it harder for private firms to raid government workforces. But true competition may require a shift in how federal employees are paid, to a more market-based system that benchmarks federal salaries against their private-sector counterparts, say people familiar with a study due to be released next month.

The IT recruiting push is a necessity for the government. Anywhere from one-third to one-half of the 60,000 IT employees in the federal workforce will be eligible for retirement in the next three to five years. That, coupled with the long-standing difficulty agencies have in competing with the private sector for top IT talent, threatens the ability of government to manage services, a conclusion reached in a recent U.S. General Accounting Office report on federal retirements.

"If a lot of people leave en masse, it would have dire consequences for the federal government," said Ira Hobbs, acting CIO at the U.S. Department of Agriculture and co-chairman of the Federal CIO Council's workforce committee.

"There's a huge challenge ahead, and we could get to a crisis if we don't manage it," said Fred Thompson, a U.S. Treasury Department official who works on IT workforce issues.

In response, the government recently boosted pay for IT workers and is doing more to reach out to private-sector employees. Efforts include informing outplacement services handling corporate layoffs of federal IT job opportunities.

Quick Link For more on government and IT, visit our Washington Watch page.
www.computerworld.com/q?s1300

Some IT managers said the government has to do a better job marketing its opportunities. Ginni Schaeffer, a program analyst at the U.S. General Services Administration, said government IT work has given her satisfaction she doesn't think she would find in the private sector. "I do work that is meaningful," she said. "I don't think the almighty dollar is the be-all and end-all in [career] decisions."

But compensation is important. The Federal CIO Council, which represents top government IT officials, is a sponsor of a study on IT pay that's due next month from the National Academy of Public Administration, a Washington-based nonprofit group. The report is expected to recommend a variety of reforms, including pay based on performance.

The government is hiring. Of the approximately 17,000 openings listed on the main government job Web site (*www.usajobs.opm.gov*) last week, 1,043 were IT-related. The weakened economy is helping to increase the talent pool; applications for some IT positions have doubled in the past year, according to officials at the U.S. Office of Personnel Management.

But problems in hiring remain. IT job pay rates in mid-to-senior-level federal posts fall below industry averages, which isn't helping the government compete for certain IT skills, such as computer scientists capable of working in advanced-technology labs.

So You Want A Federal Job?

No instant hiring: Getting hired can take months. Managers have to follow a hiring process that may include time-consuming background checks.

Relocation: Seizing opportunities may mean pulling up roots.

Sane hours: Government IT jobs can be demanding and time-consuming, but the government strives to encourage family-friendly work environments.

Benefits: No stock options, but there are good health benefits and government contributions toward savings plans, and some places offer flexible work schedules. Government jobs aren't lifetime appointments, but employees have greater protections than private-sector counterparts.

However, Jim Klein, a personnel official who handles IT hiring for U.S. Army Corps of Engineers research facilities in Vicksburg, Miss., said the total benefits package is attractive, with health, retirement and education benefits. ◗

Continued from page 1

IT Jobs

under way, Longs Drug Stores Corp. in Walnut Creek, Calif., for instance, is looking to fill 15 to 20 IT openings, said Dave Klinzman, vice president of IT operations.

"Our business is not driven by the tech sector and its ups and downs. It's driven by the retail environment," said Klinzman, who noted that the company's hiring is affected by seasonal swings in demand. He said the company is currently looking to hire Unix administrators and Java programmers.

Though cost constraints have delayed hiring for some positions, the Chubb Group of Insurance Cos. in Warren, N.J., plans to hire "tens" of IT workers with specialized application development skills this year, said Gerald Giesler, a Chubb senior vice president. These positions include midlevel Java developers and database administrators, he said.

But he said hiring is certainly less frenetic than it was a year ago. "We're probably openly recruiting half as many [IT workers] as last year at this time," said Giesler.

In the Houston area, the oil and gas, energy and consumer retail sectors are still hungry for tech workers, according to Shawn Galloway, a Houston-based senior recruiter at eCalton Inc., based in Vero Beach, Fla. Skills in demand include networking and Windows-based experience. But many of these positions are targeted at contractors, and IT workers "just can't be as picky as they used to be," Galloway added.

Recent workforce studies paint a somewhat muddy picture as to whether the economy is headed for a recovery. For instance, July saw a record number of job cuts, with 205,975 payroll positions pared, according to Chicago-based outplacement firm Challenger, Gray & Christmas Inc.

But those numbers haven't put a dent in the national unemployment rate, which remained steady at 4.5% last month, according to the U.S. Department of Labor. Though the economy isn't headed for a recession, expect it to "remain sluggish for the next two quarters," said Wes Basel, an economist at Economy.com Inc. in West Chester, Pa.

Job seekers would do well to avoid technology and manufacturing firms, because they have announced the largest number of layoffs since the beginning of the year, the Challenger report said. "We're not seeing a bottom right now" among companies in these sectors, said John Challenger, the company's CEO.

Those industries are experiencing an inventory correction, along with a global slowdown in demand, said Basel. ◗

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Taking a Look Behind The Scenes at the NIPC

How Ronald Dick is waging a war to rid the nation of computer security threats

BY DAN VERTON

INTELLIGENCE DATA began pouring in on a Thursday afternoon. The press hadn't picked up on it yet, but there was a problem brewing on the Internet. A computer worm had been uncovered that, if left unchecked, could begin to bog down Web sites and e-commerce around the country.

It was July 12. There were no reports yet of widespread failures or denial-of-service attacks stemming from what would eventually become known as the Code Red worm, but Ronald Dick knew his agency couldn't afford to wait. The National Infrastructure Protection Center (NIPC) had been criticized harshly in the past — including once in a report by the General Accounting Office (GAO) shortly after Dick took over as director in March — for not providing the type of advance warning and strategic analysis many in government expected from it.

A warning had been sent out in June outlining the vulnerability that the Code Red worm would later take advantage of. But now a private-sector analyst was telling Dick that there were signs that something was already spreading like a disease on the Internet. Dick sent the information to Robert Gerber, chief of analysis and warning at the NIPC. Gerber, a senior national intelligence officer on loan to the NIPC from the CIA, ordered an immediate intelligence "work-up."

Like medical specialists exchanging information on a patient's health, Gerber's analysts quickly began exchanging information via secure telephone and videoconferencing links with officials all over Washington. By July 19, the teleconferences had reached a frenzied pace. There were as many as 20 a day, and they involved the Defense Department, the National Security Agency (NSA), the Commerce Department, the CIA, the Secret Service and even private-sector groups, said Dick.

"We [still] don't know who is responsible for Code Red," said Dick on July 27, three days before holding a national press conference to urge Internet users to inoculate their systems against the worm. "But my job is simply to stop it."

For Dick, a 23-year veteran of the FBI who spent five years marketing mainframe computers for Burroughs Corp. (which later became Unisys Corp.) before joining the FBI, stopping a worm outbreak would prove more challenging than he ever imagined. More than a half-dozen warnings had gone out a month in advance, including one from the NIPC. Yet more than 250,000 computers were infected in nine hours on July 19 alone.

And it wasn't over yet.

The Second Warning

On Friday, July 27, it became clear to the NIPC and some private-sector experts that the Code Red worm wasn't dead. Analysis showed a second variant of the worm was set to launch another round of infections beginning at 8 p.m. Eastern time July 31.

Dick sat in his office in FBI headquarters overlooking Pennsylvania Avenue. With him was Leslie Wiser, an investigator at the NIPC and the FBI agent responsible for nabbing Aldrich Ames, the most damaging mole in CIA history. They brainstormed ideas on how to get the word out to the hundreds of thousands of systems administrators who still hadn't patched their systems.

JUST THE FACTS

Ronald Dick

Highlights of the NIPC director's résumé:

Qualifications:

- Certified Public Accountant; FBI special agent, 23 years.

1981 - 1991 Worked antidrug operations. Helped break the Cali drug cartel's operations in South Carolina.

1992 Served as member of FBI institutional fraud unit.

1995 Helped create first national computer crime squad.

1998 Chief of training and outreach programs. Helped create FBI InfraGuard program.

1999 Coordinated national computer crime investigations.

2001 Named director of the NIPC.

STAN BAROUH

RONALD DICK says the NIPC has made progress since the GAO criticized it in a report in May.

The conclusion was that the information-sharing partnership that had developed between the NIPC and various private-sector groups had worked. Early warnings helped the White House and other federal agencies sidestep the initial outbreak of the worm.

But there were still companies out there that thought their systems weren't important enough to be affected. More systems would almost certainly be victimized. And if the worm proved as damaging as some private-sector experts said it would be, Internet traffic could slow to a crawl.

Dick was at a loss. "Everybody issued warnings, and yet we didn't reach a significant number of people who utilize the software," he said. "How do we do it?"

They decided to hold a press conference. Dick acknowledged that he can't call a press conference every time a worm pops up. But in this case, he said, "there is reason for concern" that the performance of the Internet could be affected. So he held a press conference July 30, flanked by Gerber and six representatives from private industry. The decision attracted an unprecedented level of praise from industry groups, as well as criticism from security pundits who later called it FBI "hype."

The NIPC's critics have inflicted more wounds than Dick has the resources to attend to. However, Dick is assembling a top-notch interagency emergency team that includes Gerber; Wiser; Navy Admiral James Plehal, who took over as the center's deputy director in February; a new watch chief recently hired away from the NSA; and a Secret Service agent whose appointment to the NIPC is pending.

"When I got here, we were basically a start-up," said Dick. "There wasn't a staff here, there weren't facilities here and no dedicated source of funding.

"We basically had to build those capabilities from the ground up," said Dick. "It takes time."

Established in February 1998, the NIPC's mission is "to detect, deter, assess and warn" the government and the private sector of significant threats to Internet security. The NIPC is a joint center made up of representatives from various agencies.

Two areas in which the NIPC has been criticized by the GAO — and rightfully so, according to Dick — are strategic analysis and data mining. The GAO report "was fair" and an accurate reflection of what was happening at the NIPC when the report was published in May, Dick said.

And the GAO offered more praise than criticism for the NIPC in its report — something the media ignored, according to Dick and Wiser.

"It's disheartening at the end of the day for people who are working 14 to 15 hours a day and trying to put out a good product to read some of the headlines that come out," said Dick. "If [the GAO and Congress] came to NIPC today they would not find the same issues bogging the agency down."

Things are getting better, especially in strategic analysis and data mining, thanks to Gerber and a new data warehouse and data mining pilot project being put together by McLean, Va.-based Mitre Corp. and several national research laboratories.

But Dick, who is using the Centers for Disease Control as a model for the new NIPC, needs specialists for his surgical team. He acknowledges that part of the NIPC's problem has been the lack of expertise in the IT aspects of critical infrastructure protection. "I need people who know gas and water, people who know electric power and the transportation system," he said.

"It's not going to be a quick fix," said Gerber. "Frankly, one of my goals is to build the kind of place that if you were an intelligence officer you couldn't imagine not working here," he said. "I'm of the mind that two years from now, we'll need to look back and ask, 'Did we stretch far enough?' " ◗

Quick Link
For more information on this topic, visit our Security Knowledge Center.
www.computerworld.com/q?k1600

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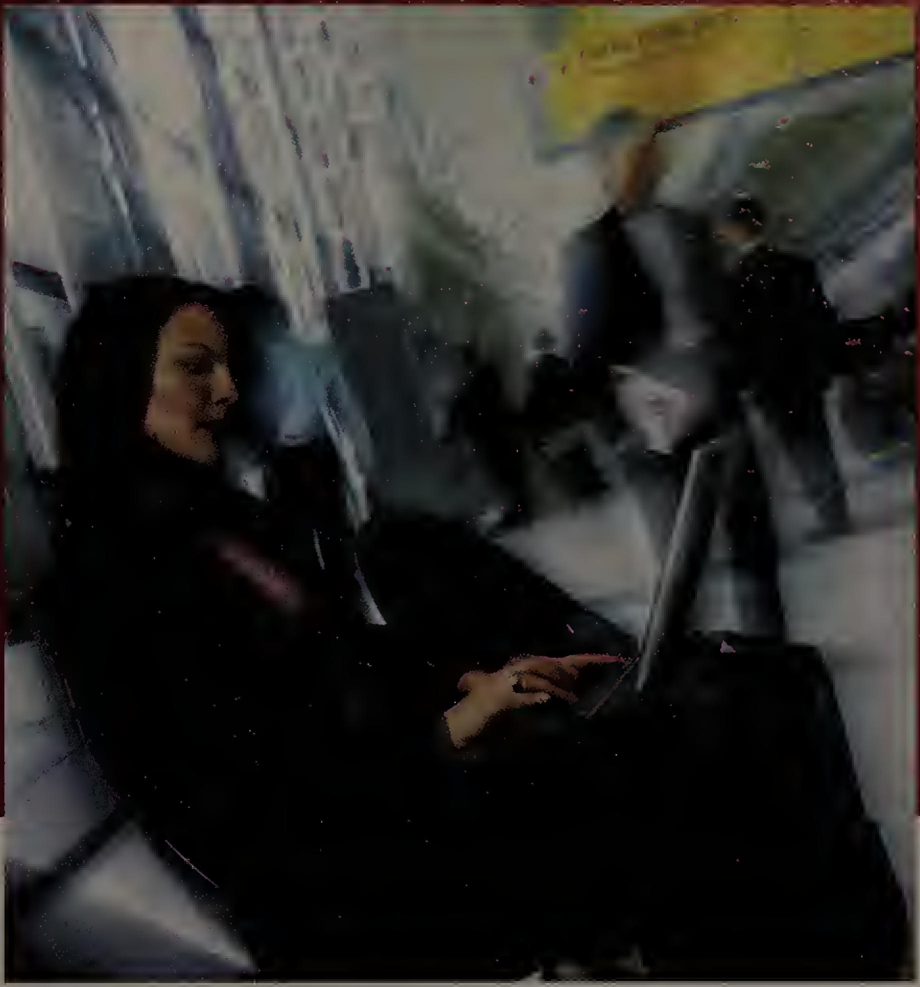

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New Code Red Worm Slows Systems With Scans

Microsoft patch helps little as Code Red II seen as more dangerous than predecessor

BY TODD WEISS

THE CODE RED worm was followed last week by an even more aggressive one, dubbed Code Red II, that uses infected computers to unleash massive port-scanning attacks affecting systems that aren't even vulnerable to the two worms.

As a result, users who thought that installing a Microsoft Corp. patch would comfortably protect their Windows 2000 and Windows NT 4.0 systems against Code Red-related problems may need to change their thinking.

Microsoft's patch will prevent computers running the software vendor's Web server software from being infected by the worms. But users and analysts said it can't stop servers from becoming potential targets for the system scans produced by Code Red II.

"There's a lot of innocent victims here," said Marty Lindner, an incident-handling team leader at the CERT Coordination Center at Carnegie Mellon University in Pittsburgh. Even though many users have patched their servers, he said, the scans are tying up their available system resources and slowing down performance.

Joe Hayes, co-CEO at Media3 Technologies LLC, a Web-hosting business in Pembroke, Mass., said his company was hammered by scans coming in at a rate of thousands per second, despite having installed the patch for Microsoft's Internet Information Services (IIS) software on its Windows-based servers.

"We did everything we were supposed to do," Hayes said. But, he added, port scans from infected machines elsewhere tied up Media3's servers in a denial-of-service type of attack. Even Unix and Linux servers that aren't threatened by the Code Red worms were affected by the scanning probes, according to Hayes.

Hint of Attack

In a notice on its Web site, Media3 said it began to feel the effects of Code Red II on Aug. 4, when it prevented Web pages from loading. With help from Microsoft, the notice stated, the company was able to restore service late the next night. But some users continued to experience "anomalies" in performance after that, it added.

While Code Red II was given a similar name to the worm that struck systems in two waves starting July 19, it isn't a variant of the first Code Red, stated SecurityFocus.com, an information service in San Mateo, Calif. It said Code Red II is an all-new worm that tries to exploit the same hole in IIS.

Security analysts view Code Red II as potentially more dangerous than the first worm for two reasons. First, it installs a backdoor program in systems that could allow attackers to take control of infected computers. The second reason is that Code Red II also is more aggressive about trying to spread itself to other systems, analysts said.

Greg Shipley, a consultant at security services firm Neohapsis Inc. in Chicago, said Code Red II targets "neighborhoods" of IP addresses, concentrating its attacks instead of launching random global ones like the first worm did.

According to Lindner, CERT had confirmed at least 150,000 Code Red II infections by last Thursday. Ironically, even Microsoft was affected. It confirmed that two unpatched servers used for its Hotmail e-mail service were infected by Code Red II. ◗

Keeping Up With Code Red

Code Red II is an all-new worm that emerged last week, but it targets the same systems as the first Code Red and can be blocked by the same software patch.

How to tell them apart: The original worm uses a string of *X*'s as filler characters in its header, while Code Red II uses the letter *N*.

What they try to exploit: A buffer overflow problem in Microsoft's IIS software on systems running Windows 2000 and Windows NT creates the vulnerability.

How to protect yourself: Go to *www.microsoft.com/technet/security/bulletin/MS01-033.asp* to read Microsoft's security bulletin and download its patch.

Continued from page 1

MCSE Training

MCSEs design, install, support and troubleshoot information systems based on Microsoft Corp. software.

Alan Paller, director of the SANS Institute, said the recent outbreak of the Code Red worm, which took advantage of vulnerabilities in Microsoft's Internet Information Services (IIS) software and a misconfiguration in the Internet Server Application Interface (ISAPI), is a perfect example of how MCSE training falls short.

"It is a situation where MCSEs had no idea that there is a fundamental vulnerability in IIS and ISAPI mapping and so had no way to protect their systems other than after-the-fact patching," said Paller.

"One of the saddest dimensions of information security is that hundreds of thousands of people earned MCSE certifications without being required to demonstrate any competence in security," stated the SANS newsletter.

Robert Stewart, general manager of training certification at Microsoft, countered that each of the four core classes required for MCSE certification covers various aspects of security.

"There are definitely items and sections of the core exams that focus on security," said Stewart. In fact, the Windows 2000 Server administration course includes a "pretty big piece on security," he said. "And you can't pass through the gate and become an MSCE without passing it."

MCSE students are required to take five core exams on how to configure, design and administer a Windows 2000 network. (Windows 2000 certification replaced NT certification this year.) However, of the four core design courses offered, only one is geared specifically toward security — and it's optional.

"There's nothing specific on security," said Bob Hillary, vice president of academic affairs and chairman of the IS department at New Hampshire Community Technical College, a major MCSE training center, in Portsmouth. "It's not that MCSE training is without security, but it's an elective. Just as they have an 'MCSE plus I' for their Internet certifications, they should have an 'MCSE plus S' for security," said Hillary.

Although the in-depth security course is an elective, Stewart said, the fact that Microsoft has designed a specific course on security demonstrates the company's commitment.

MCSE training is conducted by dozens of private service providers throughout the country. Microsoft, through its training Web site, "makes no warranties or representations with regard to their services."

Terry Lewis, an MCSE training instructor at Emergent Technologies Inc. in Reston, Va., agreed that security training is "very basic" and should be enhanced. However, to do that, the five-day core courses would have to be lengthened, he said.

"In Microsoft's defense, I don't think that in a certification training environment you can teach the in-depth subject of security," said Lewis. "Should there be more security? Absolutely. Is there any time that can be thrown out of the current courses and devoted to security? No." ◗

Security Optional

Required core exams for Windows 2000 MCSE certification:

70-210 Installing, Configuring and Administering Microsoft Windows 2000 Professional

70-215 Installing, Configuring and Administering Microsoft Windows 2000 Server

70-216 Implementing and Administering a Microsoft Windows 2000 Network Infrastructure

70-217 Implementing and Administering a Microsoft Windows 2000 Directory Services Infrastructure

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Crashing The Party

ERIC YANG

Some amazing advances have taken place in the two decades since IBM introduced what was to become the industry-standard personal computer. Now if only we could get rid of those blue screens.

BY BOB BREWIN

HIGHER SPEEDS? You bet. More functionality? Count on it. Better mobility? Absolutely. The reliability you're looking for? You may have to wait another decade or so.

During the next 10 years, the personal computer will evolve into a smarter machine, with vision systems that can sense a user's presence and advanced handwriting-recognition capabilities that will support note-taking on electronic legal pads.

Mobile users won't have to switch out modem cards every time they move from a broadband wireless campus network to a nationwide high-speed network, because manufacturers will integrate wireless support directly into chip sets. The demands of mobile users — in the office, on the factory floor and at home — will make the desktop PC as we know it an endangered species.

At home, high-powered multimedia PC servers will act as the nexus of the smart house, managing everything from delivery of high-definition television to the control of a wide variety of appliances, with data and video beamed to flat-panel displays throughout the home.

That's the achievable vision for the PC five to 10 years into the future, according to Microsoft Corp. and various PC manufacturers. But the vision is marred.

Despite all the advances, PCs based on the Microsoft and Intel Corp. architecture will continue, well into the next decade, to do what they have done for the past 20 years: crash.

Craig Mundie, senior vice president for advanced strategies at Microsoft, said that while the Windows XP operating system due for release this fall represents a "quantum improvement in reliability" over previous operating systems, it will require a "fairly heroic leap" to develop a completely stable machine.

Mundie explained that stability needs to be looked at "from a 10- to 20-year horizon, and we're only on Year 11 for Windows NT."

David Bradley, a senior engineer at IBM who helped develop the basic I/O system, keyboard and display for the original IBM PC 20 years ago, agreed that users will continue to experience stability and reliability problems for the foreseeable future due to the nature of the PC beast.

Functionality vs. Stability

"The space program puts very high quality into its software with a great deal of time and effort, at the expense of a great deal of functionality," said Bradley. But PC software supports many different applications — often running at the same time — which results in instability, he explained.

"The major reason for instability in a PC is the breadth of things you can do," said Bradley. "You can do any number of jobs. Different applications use different resources, and interference [between the applications] is sort of inevitable."

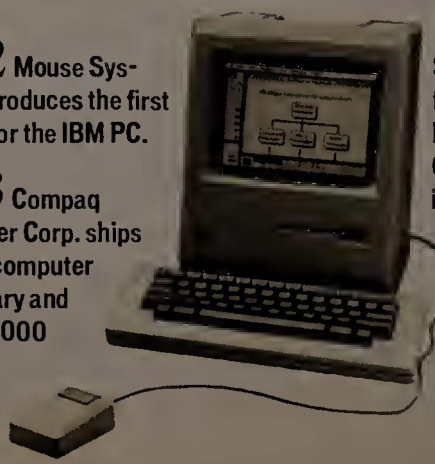
While "blue screens" have become less prevalent in the

Timeline

1977 Apple Computer Inc. delivers the Apple II.

1980 Sinclair introduces the ZX80 PC.

◂**1981** IBM introduces the IBM Personal Computer on Aug. 12.
■ Xerox Corp. ships a new computer, the Xerox Star, which introduces the graphical user interface concept and uses a mouse for the first time.



1982 Mouse Systems introduces the first mouse for the IBM PC.

1983 Compaq Computer Corp. ships its first computer in January and sells 47,000 units worth $111 million, the greatest first-year sales in the history of U.S. business. Compaq goes public; investors buy 6 million shares in one day.

1984 Apple Computer Inc. introduces the ◂Macintosh.

1985 A group of industry leaders meets to set a CD-ROM standard.

1986 WordPerfect 4.2 ships.

1987 Microsoft announces Excel for the PC, the first Excel product for Windows.
■ IBM and Microsoft announce Operating System/2 (OS/2).

past 20 years, they're not going away, Bradley added. "Instead of cursing the failure, [users] should celebrate the billions of instructions" that don't go awry, he said.

But the last thing CIOs and chief technology officers want to hear is that reliability problems will continue to plague the machines that they have increasingly come to rely on to run their businesses.

"[Mundie's] vision and ours are not quite in sync," said Gary Robertson, CTO at Troy, Mich.-based Delphi Automotive Systems Corp. "We absolutely want a stable environment," Robertson said, adding that PCs "are commodity products, and commodity products don't crash. They have to be simple to use, easy to configure and cheap."

Marty Larson, CIO at Consolidated Freightways Corp. in Vancouver, Wash., said he found it "baffling that they [haven't yet] got the technology to the point where [vendors can provide] a stable and reliable environment." Larson added that reliability tops his wish list of what he would like to see in the PC of the future.

Larry Kinder, global CIO and executive vice president at New York-based Cendant Corp., which owns the Avis Group Holdings Inc. car rental business, 10 hotel brands and Century 21 Real Estate Corp., said stability shouldn't be too much to ask for. At the very least, he said, Microsoft should focus its efforts on fixing what he called "rude crashes" that completely lock up the PC. Kinder added that he has learned to live with the "polite crash" that "bumps you out of an application or erases itself or just stares at you."

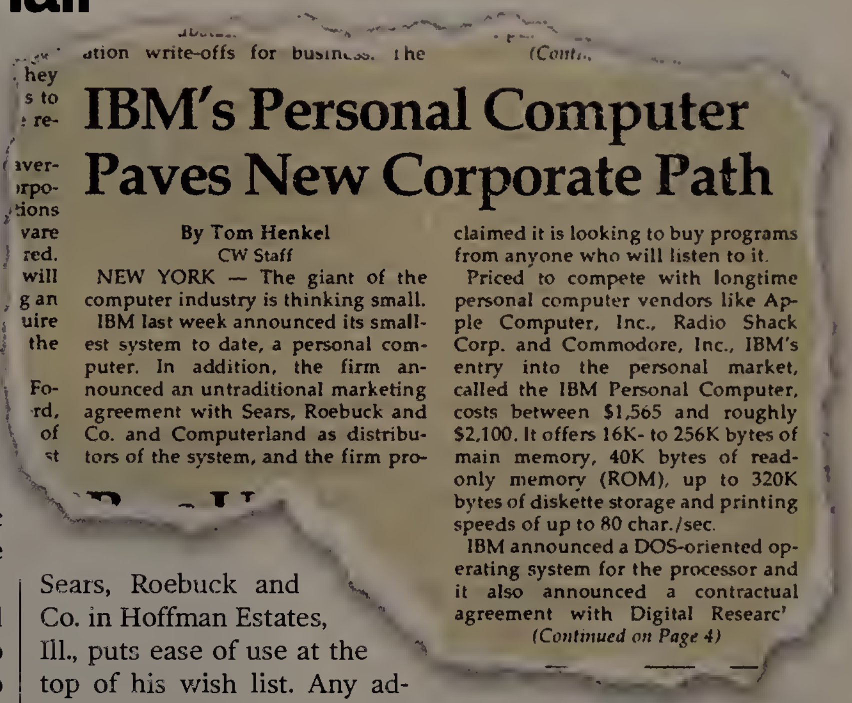
While the PC industry sees its future in the development of smarter and more multifunctional machines, CIOs appear to be more interested in simplifying them.

Bill Martin, global operations director at Delphi Automotive, said he longs for the day when installing a corporate PC into a network is no more complicated than plugging a lamp into an electric socket or picking up a phone and getting a dial tone.

Thinking Small

***Computerworld* ran this story about IBM's introduction of "its smallest system to date" on Page One of our Aug. 17, 1981, issue. We even reported that "the system operates on a standard 120V current and does not require any special cooling facilities."**

For the full text of the article, go to our Web site at *www.computerworld.com/q?22521.*



IBM's Personal Computer Paves New Corporate Path

By Tom Henkel
CW Staff

NEW YORK — The giant of the computer industry is thinking small.

IBM last week announced its smallest system to date, a personal computer. In addition, the firm announced an untraditional marketing agreement with Sears, Roebuck and Co. and Computerland as distributors of the system, and the firm proclaimed it is looking to buy programs from anyone who will listen to it.

Priced to compete with longtime personal computer vendors like Apple Computer, Inc., Radio Shack Corp. and Commodore, Inc., IBM's entry into the personal market, called the IBM Personal Computer, costs between $1,565 and roughly $2,100. It offers 16K- to 256K bytes of main memory, 40K bytes of read-only memory (ROM), up to 320K bytes of diskette storage and printing speeds of up to 80 char./sec.

IBM announced a DOS-oriented operating system for the processor and it also announced a contractual agreement with Digital Researc'

(Continued on Page 4)

Martin also said he would like to see the staff he uses to support PCs whittled down to the size needed to operate the company's global network.

"We're long past the stage of changing our own spark plugs in our cars," Robertson said. "Why do we need to be loading software? PCs should be plug-and-play."

Ken DeWitt, vice president of integration and planning at Sears, Roebuck and Co. in Hoffman Estates, Ill., puts ease of use at the top of his wish list. Any advances in hardware should also be matched with "advances in software distribution and management, [with] software centrally managed rather than [having] bigger and bigger clients," he said.

The desktop PC should also be redesigned so "it can be easily made mobile," Dewitt said. "As technology changes, we will have [the requirement for many] more mobile devices."

Consolidated Freightways' Larson said his company has started to move away from traditional desktop PCs toward a wireless thin-client/server architecture following completion of a pilot program at its terminal in Vancouver.

Simplifying input is also an issue for CIOs. Many users, including DeWitt and Kinder, said they would like to see future PCs equipped with truly functional voice-recognition capabilities.

But, IBM's Bradley noted, that's a wish that has been unfulfilled for the entire two decades he has been involved with PCs, and its fulfillment remains elusive.

"For the past 20 years, voice-recognition systems have been two years away," Bradley said wistfully. ◗

You Never Forget Your First

We asked visitors to our online communities to recall memories of their first PCs. Here's a sampling of their responses:

I asked my wife if she would divorce me if I bought the PC (she said no), and I ordered the PC in November [1981]. About $5,000 for 4.7-MHz 8088, 64KB of RAM, monochrome monitor, PC DOS 1.0, one 160K floppy disk drive, a printer and a word processor. State of the art.

During the six-week order time, all I had was the technical reference, which I read cover-to-cover, including the BIOS code. First hard disk (1983) was 30 MB for $1,500 – Comdex special, half price! I still have the computer in my attic.

– John Shirey

One day back in the early 1980s, a consultant brought in a small suitcase to work. He said it was a portable computer. We affectionately referred to it as the "bun warmer," because there was a space above the floppy drive where you could put a breakfast roll and the heat dissipated by the circuits was sufficient to melt butter.

– Larry Thaden

I first saw an advertisement for the Apple II around December 1980.

I couldn't afford the computer at the time (around $2,000), so I convinced my friend Stan to go half on it. Every two weeks, it would get packed up, and the exchange would happen on Friday nights. I spent many a Saturday going to sleep around 4 a.m. with my eyes burning from staring at the black-and-white screen.

– John Vargoshe

For $100, I bought a Timex Sinclair ZX80 back in 1982, and my life just has not been the same since. I remember long nights of typing in programs from the companion magazine(s) and debugging them. I learned Basic programming that way.

Now I work as a network administrator at a local college. A great job. And I owe it all to that lowly ZX80. (Plus tons of training and schooling, of course).

– Charles Brewster

To read more personal computing memories – or to post your own – visit **www.computerworld.com/pcmemories.**

1989 The Personal Computer Memory Card International Association (PCMCIA) is formed.

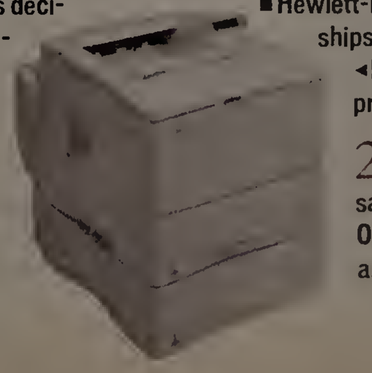
1991 World Wide Web program is released for the Internet by Tim ◂Berners-Lee in Switzerland. WWW is a hypertext system for publishing information on the Internet.

1993 Intel introduces the Pentium processor.▸
■ Windows applications outsell DOS programs for the first time.

1994 Mosaic Communications, which later became Netscape Communications Corp., releases the Netscape Navigator 1.0 Web browser.
■ Novell Inc. buys WordPerfect Corp. for $850 million.
■ Iomega Corp. introduces its Zip drive and Zip disks, floppy-disk-size removable storage in sizes of 100MB.

1995 The first macro virus is found in a Word document.
■ Novell announces its decision to exit the personal productivity business applications business.

1997 The first 56K bit/sec. modem is introduced.



1998 Compaq buys Digital Equipment Corp. for $9.6 billion.
■ Hewlett-Packard Co. ships its 30 millionth ◂Laser Jet printer.

2000 Unit sales of PCs drop 0.8%, the first annual decline.

Senior news columnist Frank Hayes asked some PC industry pioneers to describe their vision of the PC three to five years from now. Here are their responses:

FURNALD/GRAY

With the advent of third-generation cellular communication and other initiatives which will provide ubiquitous, wireless, broadband connectivity, we'll be online all the time. Personal computers will come in a variety of forms, including wristwatch computers, pocket computers, and small flat panels. Panel displays will become competitive with paper, and we'll be doing a lot of our reading on our computers.

RAY KURZWEIL, INVENTOR OF THE FIRST TEXT-TO-SPEECH SYSTEM

I'd just like the commercial PCs to measure up to the level of quality and ideals of the original inventors of personal computing, especially with regard to being a great learning environment for children. I'm not very impressed with the lack of progress in the last 20 years of commercialization.

ALAN KAY, SMALLTALK INVENTOR AND ARCHITECT OF THE WINDOWING GUI

I believe the PC will continue to evolve and remain the dominant network and Internet access device. While PDAs and smart phones are very useful, they fall far short of the capabilities most people need to do real work and real browsing. The notebook PC will likely continue to gain market share instead of losing it to PDAs and smart phones.

ROD CANION, CO-FOUNDER,
COMPAQ COMPUTER CORP.

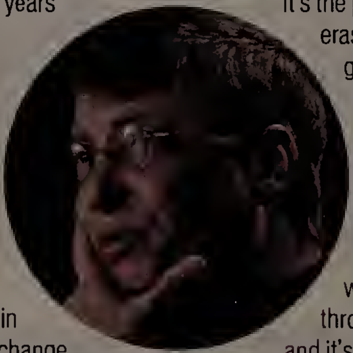
Gates Weighs In

Microsoft Chairman and Chief Software Architect **Bill Gates** reflected on the future of the PC during a conversation last month with *Computerworld*'s Carol Sliwa.

Can you describe what you think the PC will be like five years out? Well, one thing we're on the verge of right now is having the tablet form factor, where reading and taking notes and annotating things wherever you are – including when you're in meetings or traveling around – becomes natural.

And if we look at the original scenarios that we had in mind, some we've been very successful in. We said, "OK, slides. We can take what became PowerPoint and make it better than slides. Word processing. We can take dedicated word processors, make them cheaper, better."

But in many other areas like reading, do people read magazines off their computer screen? No. When they're in meetings and they want to take a note or facilitate the meeting, is the computer helping with that? No, it's not. And there's a lot of very ambitious scenarios that in the next five years will be achieved.



Can you imagine 10 years out? Really modeling the business where you can actually see schema models that really let you understand what's going on in your business and . . . change those models without having to go back and have some two-year IT project to do it, that's probably in the 10-year time frame. That's very ambitious, that we'd get modeling to be that mainstream.

What has been your biggest disappointment with regard to the PC? We made an assumption when we started the company that the hardware industry would continue to turn out miracles. You know, Moore's Law, improvement in the microprocessor, cheaper memory, cheaper disk, higher-resolution screens and then wireless technologies. And those guys, whether it's the printers or the cameras, they have done a great job. They're continuing to do a great job. And it's a lot of their breakthroughs that enable us to do neat new things.

The one area where the breakthrough isn't taking place, and it's tough, is very inexpensive broadband access to homes or even small businesses. The price of broadband has not gone down. And there's nothing in the next two or three years that's really going to change that. So if I had a wand and I could ask for one more hardware technology miracle, it'd be some way of having $20-a-month broadband to homes and small businesses. ◗

THE ASSOCIATED PRESS

Almanac: 1981

Population of the world: **4.529B**

Population of U.S.: **229,465,714**

U.S. gross domestic product: **$3.1 trillion**

U.S. unemployment: **7.1%**

Minimum wage: **$3.10 per hr.**

First woman on the U.S. Supreme Court: **Sandra Day O'Connor**

Nobel prize for literature winner: **Elias Canetti**

Pulitzer prize for fiction winner: **John Kennedy Toole, *A Confederacy of Dunces***

The Masters golf champion: **Tom Watson**

Stanley Cup winners: **New York Islanders**

Space program: **The first reusable spacecraft, *Columbia*, circles the globe 36 times and returns to Earth.**

August 1

MTV premiers. Also on this day, Prince Charles and Princess Diana begin their two-week honeymoon.

August 3

About 11,000 air traffic controllers go on strike in the U.S.; they are later fired by the Reagan administration. Also, Burroughs Corp. agrees to buy Memorex Corp. for $106 million.

August 6

The 30-year bond yield is 14.06% and the Dow Jones industrial average is 952.91.

August 9

Baseball returns after a two-month player strike.▸

August 12

IBM introduces the IBM PC. IDC predicts PC sales will reach 1.3 million units in 1985.

August 13

In East Berlin, 50,000 people watch a parade celebrating the 20th anniversary of the Berlin Wall. Also, Pope John Paul II leaves an Italian hospital after surgery related to the May attempt on his life.

August 19

The U.S. shoots down two Libyan jets.

August 24

Mark David Chapman is sentenced for the murder of ex-Beatle John Lennon.

August 25

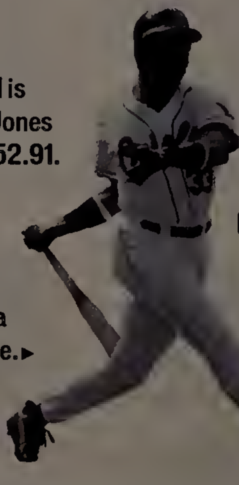
Voyager II begins sending photos of Saturn back to earth.

August 27

Dow Jones industrial average sinks to 889.01.

August 28

John Hinckley Jr. pleads innocent to charges that he tried to assassinate President Ronald Reagan.



August 31

The president and prime minister of Iran are assassinated by a bomb in Tehran.

– Compiled by Mark Hall

Quick Link For more coverage of the IBM PC's 20th anniversary, including industry statistics, a history of the computer industry since 1950 and reader memories of their first PCs, visit **www.computerworld.com/q?z2000.**

The new SuperStack® 3 Switch 4300. The thought behind it was simple.

You're looking for a switch that offers extra ports, high performance and easy management. But you're not looking to put a big hole in your budget. Our new SuperStack 3 Switch 4300 offers 48 10/100 Mbps wirespeed ports, up to four Gigabit uplinks, free 3Com® Network Supervisor software and a lifetime warranty—at a truly affordable price.* Only 3Com would think to do that.

Talk to your 3Com reseller about the SuperStack 3 Switch 4300 and how you can save even more money by trading in your old switch. Visit www.3com.com/value4300, or call 1-888-906-3266, x469.

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GAO Review Finds IT Lax at Department of Commerce

BY PATRICK THIBODEAU
WASHINGTON

Hackers working for a federal watchdog agency have been running amok through the U.S. Department of Commerce's IT networks as part of a security review, launching more than 1,000 system scans and avoiding detection in all but a few cases.

The key problem identified by the General Accounting Office was a lack of central authority over IT security. In a report released at a congressional hearing earlier this month, the GAO said the Commerce Department's CIO had no specific budget to address security issues and lacked direct control over the agency's bureaus and divisions.

The different units have been operating with their own budgets and CIOs, according to the GAO. And because there's no common network infrastructure at the Commerce Department, the report said, various bureaus have established their own access paths to the Internet. The GAO noted that a $4 million project to consolidate those networks was approved in April.

In response to the GAO's assessment, Commerce Secretary Don Evans ordered all agency heads to make IT security a priority and promised to "allocate the necessary resources" to ensure the safety of data, according to Deputy Secretary of Commerce Samuel Bodman. In addition, Bodman said, the department is giving its CIO — a job currently filled on an acting basis — the power to seek security improvements at the individual bureaus.

Bodman, who joined the Commerce Department in late July, offered no excuses for the agency's security shortcomings at the hearing and said he was "embarrassed to be here."

The GAO, at the behest of the House Subcommittee on Oversight and Investigations, has been systematically reviewing information security practices at federal agencies. Its report said the GAO was able to penetrate systems from inside and outside the Commerce Department "using readily available software and common techniques."

At the hearing, a GAO official said only four of the 1,000-plus system scans sent as part of the security review were detected by the Commerce Department — an assertion that flabbergasted Rep. W.J. "Billy" Tauzin (R-La.), chairman of the House Committee on Energy and Commerce. Doing some quick math, Tauzin said that means "99.6% of the intrusions were not detected. . . . That's a huge number." ◗

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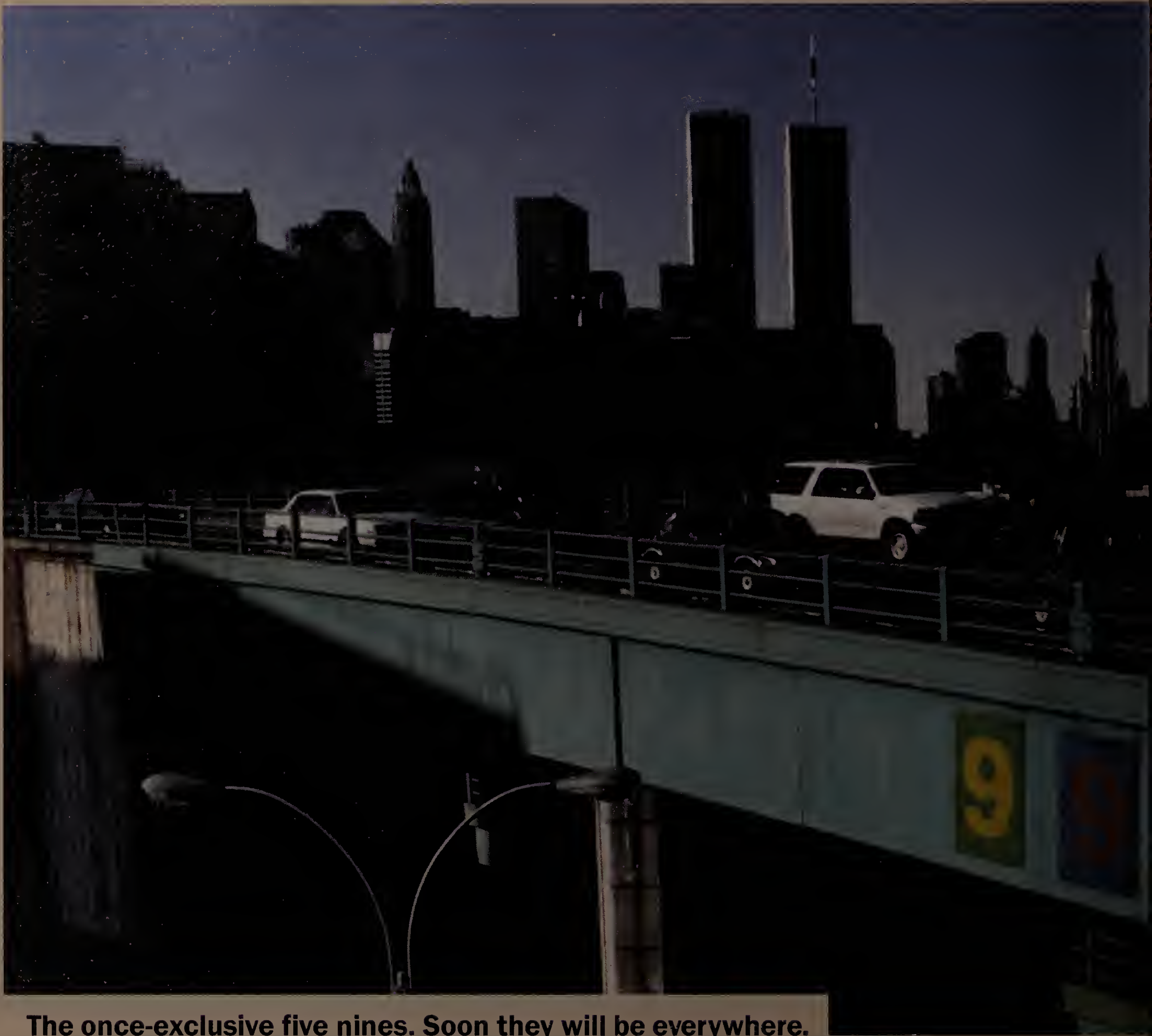

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99.999% uptime. For a server operating system, it's a measure of reliability that translates into just over five minutes of server downtime per year.* For your business, that means servers are up and running when people need them. Of course, rumors of this 99.999% uptime usually start under ideal lab conditions. But where are these five nines when your business needs them? If you're using Microsoft® Windows® 2000 Server–based solutions, they may be closer than you think. Today Starbucks, FreeMarkets and MortgageRamp, an affiliate of GMAC Commercial Mortgage,

Microsoft Windows 2000 Server Family

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are using Windows 2000 Server–based systems designed to deliver 99.999% server uptime. Of course, not all installations require this level of reliability, but one thing is for sure: The Windows 2000 Server family can help you get to the level of reliability you need. In fact, industry leaders such as Compaq, Dell, Hewlett-Packard, IBM, Unisys, Stratus and Motorola Computer Group can work with you to deliver solutions with up to five nines uptime. To learn more about server solutions you can count on, visit **microsoft.com/windows2000/servers** **Software for the Agile Business.**

Microsoft

BRIEFS

SunGard Fighting HP For Comdisco Unit

SunGard Data Systems Inc. in Wayne, Pa., filed an objection to the bidding procedures proposed as part of Comdisco Inc.'s Chapter 11 bankruptcy proceedings and said it's offering $775 million for Comdisco's technology services business. Rosemont, Ill.-based Comdisco last month agreed to sell that unit to Hewlett-Packard Co. for $610 million.

Covad Negotiating Bankruptcy, Debt Deal

Covad Communications Group Inc. said it plans to file for Chapter 11 bankruptcy protection as part of a proposed deal that would eliminate $1.4 billion in debt owed to bondholders. Santa Clara, Calif.-based Covad added that its Digital Subscriber Line network shouldn't be affected by the Chapter 11 filing.

Former Novell Chief Named Google CEO

Eric Schmidt, who stepped down as Novell Inc.'s CEO last month, was named to the same position at search engine vendor Google Inc. in Mountain View, Calif. Schmidt became Google's chairman in March, after Novell announced that he would give up the CEO job there as part of Novell's acquisition of Cambridge, Mass.-based consulting firm Cambridge Technology Partners Inc.

Viant Hit by Big Drop In Web Consulting

Boston-based Internet consulting firm Viant Corp. reported a $10 million second-quarter loss on revenue of $9.5 million, which was more than 75% less than its year-earlier revenue of $38.5 million. That announcement came one week after rivals Scient Corp. in New York and iXL Enterprises Inc. in Atlanta said they were merging in the wake of big revenue declines.

Cisco Braces for More Financial Turbulence

CEO Chambers: Networking business hasn't bottomed out yet; U.S. stabilizing

BY JAMES COPE

AFTER CISCO Systems Inc. reported weak financial results again last week, CEO John Chambers described the last two quarters as "extremely challenging" for the networking giant. And he said more tough times lie ahead.

The company's fourth quarter, ended July 28, wasn't encouraging. Cisco reported a 25% drop in revenue on a year-to-year basis and said its net income was just $7 million, less than 1% of the amount it reaped during the same period a year ago (see chart). The minuscule profit followed a $2.7 billion third-quarter loss.

Cisco still achieved an 18% increase in revenue for its full fiscal year, to $22.3 billion. But Chambers said during a conference call that fiscal 2001 "in many ways . . . was like two different years." He also indicated that the company's new fiscal year is likely to start off in a similar fashion to the second half of the one that just ended.

"While we like to say the bottom has been reached in our industry, we don't think we are there yet, although we are becoming cautiously optimistic that it may be achieved in the next one to two quarters," Chambers said. "We have seen signs of stabilization in the U.S. But Europe and Asia-Pacific may get worse before they get better."

The major growth opportunities for Cisco going forward, according to Chambers, are technologies involving the convergence of data, voice and video, especially voice-over-IP telephony using existing data networks. But some industry watchers said they aren't so sure those offerings will pay off in the near future.

Stan Schatt, an analyst at Giga Information Group Inc. in Cambridge, Mass., said it may be another two years before users embrace voice over IP as a viable alternative to switched private branch exchange telephone systems on a widespread basis.

Cisco is working on an IP-based storage network switch that could be a "killer product," Schatt said. But, he added, it probably won't be ready for another 12 months.

Cisco executives "are focusing on other markets outside of their core products" as they try to rejuvenate sales, said Jason Smolek, an analyst at market research firm IDC in Framingham, Mass. "They won't admit it, but routers and switches are slowing," he added.

Also hurting Cisco is the gray market for used networking equipment that was originally bought by failed dot-com companies, Schatt said.

"Buying a [used] Cisco 7000 router from a different source isn't a big deal to people who are tech-savvy," he said.

On a pro forma basis, not including acquisition-related costs and other items, Cisco said its fourth-quarter income amounted to $163 million, well below the year-earlier figure of $1.2 billion. ◗

A Signal of More to Come?

The financial results that Cisco Systems announced last week, compared with year-earlier figures

Fiscal year	Q4 revenue	Q4 profit	Full-year revenue	Full-year profit (loss)
2000	$5.76 billion	$796 million	$18.9 billion	$2.7 billion
2001	$4.3 billion	$7 million	$22.3 billion	($1 billion)

Tough Times Continue for J.D. Edwards

Application vendor warns of another loss as sales slump

BY MARC L. SONGINI AND SHARON MACHLIS

At a time when some of its business application rivals are reporting improved financial results, J.D. Edwards & Co. continues to struggle with losses and declining sales.

The Denver-based company warned this month that it expects to report an operating loss of about $11 million for its fiscal third quarter and take more than $160 million in charges for restructuring costs and other expenses. Revenue will total about $200 million, representing the company's lowest level since the first quarter of J.D. Edwards' 1998 fiscal year.

"This company goes from bad to worse," said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif. "They still haven't really been able to articulate a turnaround strategy and execute on it."

This most recent loss will be the eighth net deficit suffered by J.D. Edwards in the past 10 quarters. The company blamed its weak showing on a worse-than-expected slowdown in IT spending as a result of the sluggish economy.

Hank Bonde, chief operating officer at J.D. Edwards, said users in key markets such as manufacturing and distribution deferred several million dollars worth of software transactions during the third quarter, which ended July 31.

But the warning contrasts with results announced last month by rivals SAP AG and Pleasanton, Calif.-based PeopleSoft Inc. Both reported big increases in profits and revenue for this year's second quarter.

Greenbaum said the core of J.D. Edwards' installed base is midmarket manufacturers that are also now coveted by other application vendors. "They're the company to beat [in that market], and it looks like they're getting beat," he said.

Lance Travis, an analyst at AMR Research Inc. in Boston, said the current woes at J.D. Edwards may give users additional leverage with the company. "It will be in their best interests to do everything they can to keep their existing customers happy," he said. ◗

Trying to Cope

J.D. Edwards has taken the following actions this year as it attempts to recover from a continuing series of losses:

FEBRUARY Hired a new chief operating officer and a new head of marketing

MAY Laid off 8% of its employees and restructured its sales and service units

JUNE Announced increased support for supply chain collaboration

More than 280 million individuals. More than a billion lines of data. More than a trillion data elements. We're talking about a record number of records – even for the U.S. Census Bureau. But it's not just the counting that's important in Census 2000. It's also the accuracy. That's what we the people count on most. So we can know with certainty where to allocate our housing, services and government funds. Why we gain or forfeit our Congressional seats. Who makes up our nation's demographics. To review the accuracy of records from Census 2000, the U.S. Census Bureau chose SAS®. Why? We'll let our record speak for itself. Call 800-727-0025 or stop by www.sas.com/census. To learn more about the U.S. Census, visit www.census.gov.

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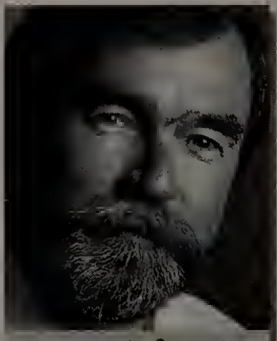
MARK HALL

Hot Enough for You?

WOW. YOU’RE SMOKIN’! No, I’m not talking about your data center after the air conditioning quit during last week’s crushing heat wave. I’m referring to the latest report on how IT makes businesses more productive.



MARK HALL is *Computerworld*’s West Coast editor. You can contact him at mark_hall@computerworld.com.

The U.S. Department of Labor last week released data showing that from April to June, nonfarm productivity jumped by 2.5% over the same quarter last year. That means companies produced 2.5% more goods and services with the same labor resources. Analysts, economists and even *The New York Times* noted that workers and companies have increasingly been “made more efficient by computers and the Internet.”

Well, take a bow.

You’re the folks who sweat blood and tears to implement ERP and CRM systems that actually work, who put in the overtime linking legacy inventory operations to state-of-the-art Web shopping applications and who helped deploy Internet infrastructures to carry your companies well into the decade.

These and IT projects like them are why this country’s worker productivity is improving, boosting profits while helping to keep a lid on inflation. And most of the IT-derived productivity improvements will continue to pay dividends.

Just last week, I was talking to Rodger Hurst, the IS manager for a couple of plants owned by Stockholm-based Autoliv Inc., the world’s largest maker of auto safety restraint systems. He said his company recently adopted a service from SupplySolution Inc. in Southfield, Mich. This start-up helped Autoliv better manage inventories with its partners. Hurst told me his company’s premium freight costs tumbled a staggering 92% in the first 90 days of the service’s use.

However, Hurst said, one of the best benefits of the new service was that it fostered “relationship-building instead of witch hunts” between Autoliv and its supply chain partners. Imagine that: technology that doesn’t alienate people but instead ignites interaction and initiative.

Smart executives know that IT-led programs are what’s going to sustain productivity rises like the one in the most current quarter. So they’re going to be turning the heat up on you to assure that productivity remains high. Try to keep your cool. ◗

WE ORGANIZED A COMPANYWIDE SECURITY SEMINAR, CALCULATED OUR ECONOMIC IMPACT, AND FIRED OFF COMMUNICATIONS TO THE MANUFACTURERS AND MEDIA ABOUT CODE RED.
WE DIDN'T HAVE TIME TO INSTALL A PATCH.
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PIMM FOX

Microsoft’s .Net: Rent or Buy?

MICROSOFT’S WINDOWS XP, which incorporates HailStorm (the XML-based platform) and Passport (a single sign-on capability), will rekindle the rent-vs.-buy debate among IT managers over software and services.

On the buy side, there’s a case that certain features run more smoothly and offer more reliability if they’re on the desktop. In contrast, renting features via remote servers that are available on demand via Web browsers is pretty common. Tim Chester, a senior systems analyst at Texas A&M University, acknowledges the quandary for distributed computing, as embraced by Microsoft’s .Net strategy (of which XP is a part).

PIMM FOX is *Computerworld*’s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

“Software as a service with the ability to call servers over the Internet using SOAP is built into the .Net platform and *is* possible, but I don’t know how many people will build mission-critical applications on that,” says Chester.

But he acknowledges that lower-cost, third-party components may counter the doubts. That’s been the mantra of many an application service provider: Get a million-dollar Sun Solaris server, an Oracle database and the best IT personnel money can buy. But rent it rather than build it yourself.

For comparison, an IT operation could build a feature to do something such as a mortgage amortization schedule, or it could license the component from a third party and access it using .Net. As Chester asks: “Why go build code when you can rent it from someone else?”

This highlights the potential for companies that desire links from existing desktop applications such as Outlook, Word, Excel and PowerPoint to Web-hosted services. Although Microsoft has pulled its Smart Tag technology, which connects keywords and images to the Internet, from the browser of Windows XP, it’s still available in these applications.

One project under development uses extensions to Microsoft’s popular Distributed Component Object Model to Web-enable Excel, offering real-time updates and data exchanges.

Quick Link

For more *Computerworld* columnists and links to archives of previous columns, head to: www.computerworld.com/q?q1000

Many IT developers are familiar with connecting Microsoft applications to database and messaging servers, so it's possible that the extension to Web services won't be a hassle. Development costs might even be lowered.

Renting software and services is compelling, says Mika Illouz, a San Francisco-based technology consultant, but a critical mass of providers needs to restructure its offerings to support SOAP before IT professionals will feel comfortable renting software and services via .Net.

And because .Net is still so new, you need to do some homework. Check whether developers are investing resources to make services you need via .Net. If they are, .Net could be the foundation to Web-enable your standard desktop applications. ◗

DAVID FOOTE

Cutting Jobs? The Pain Can Be Eased

HEARD ANY POSITIVE, uplifting IT workforce downsizing stories lately? There aren't many. I've recently heard hundreds of ugly anecdotes in vivid detail, and I'm getting really tired of them.

You'd think that after several decades of economic recessions and industry shake-ups, employers would have learned that a reduction in force accomplished in a coldly methodical, even brutal, fashion is in nobody's best interest. It's not only demoralizing and unnecessary, but also stupid. How well off will employers be in a year or two, when market disturbances subside but workers' grudges haven't and rehiring efforts are under way?

DAVID FOOTE is founder and chief research officer at Foote Partners LLC, an IT workforce management research firm and organizational consultancy in New Canaan, Conn. Contact him at **dfoote@footepartners.com.**

Sadly, senior execs often pay more attention to lawyers and finance guys when it comes to cutting heads. That's not a bad thing, but they'd be better off listening to a psychologist's perspective. Why? Because it's impossible to achieve any type of organizational change without getting to the personal stuff, and downsizing involves transitions in projects, workload, pay and careers that are extremely unsettling.

The management challenge is to get people to stop doing things the old way. That can't be accomplished impersonally. It requires a mastery of techniques and delicate skills that can be easily learned and practiced and have value far beyond the periodic reduction in force.

In *Managing Transitions: Making the Most of Change* (Perseus Books, 1991), William Bridges presents a simple three-phase transition model that eliminates much of the mystery surrounding the human side of change. He implores us to manage transition instead of change, which he describes as situational and focused on outcomes that are external (something done "to you") and virtually impossible to control. He reminds us that change triggers an internal psychological reorientation process — the "transition" that workers must endure to come to terms with change. There's a beginning and an end, and hopefully a peaceful journey in between.

Change efforts that disregard this transition process are doomed. The biggest mistake employers make when implementing reductions in force is failing to identify and prepare their workers for the inevitable psychological adjustments that sudden change produces. Leaders naively assume that when changes are decided upon and well planned, they'll just happen.

Nothing undermines organizational change more than the failure to realize who will have to let go of what, writes Bridges, so Phase 1 of his model is the "Letting Go Stage." It's critical to identify who's losing what, anticipate overreaction and acknowledge the losses. Give grieving workers ways to openly vent their anger and frustration, and repeat information until it sinks in. Explicitly define what's over and what's not. Treat the past with respect, even letting people take a piece of the old ways with them.

Phase 2 is the "Neutral Zone," an open-ended period when workers are firmly rooted in neither the past nor the present. As their world is being redefined, temporary technical and business systems are created, intragroup connections strengthened, and new ways of doing things are tried. Phase 3, "New Beginning," is exactly that. It's psychological as well as practical, with some ambivalence naturally present. There are new rules, systems, understandings, values, attitudes and identities. Consistency is important, as are acknowledging successes and celebrating even the smallest victories.

Poorly managed transitions breed guilt, resentment, anxiety, self-absorption and stress in IT workers, plus time delays, quality problems and performance problems in their projects. Can you afford that? ◗

READERS' LETTERS

Don't Blame Microsoft for Code Red Worm

WHEN SOMETHING like the Code Red worm hits machines, everyone yells for more secure software ["Microsoft in Hot Seat After Code Red," Page One, Aug. 6]. On the other hand, when the software is buttoned down tightly, everyone yells for more open access to the software. I think you can have one or the other, security or open access. For security, you need tight interoperability and restrictions on what can happen. When you put a lock on your house, you don't give away the key. (The DOJ and the states essentially want the master key to Microsoft's house.) At the same time, if you give the key to everybody in town, you can't gripe when they come in and muck up your home.

Andrew Baldwin
Programmer/analyst
Boulder, Colo.

THE VIEWS expressed in this article are the equivalent of blaming the manufacturer when your car is vandalized. If litigation is needed, it should be directed at the hackers. We should pour money into global efforts to track these people and ruin their lives. Then see how long it takes for this part of the Internet evolution to end.

Bill Lambert
Buffalo Grove, Ill.

A Reviewer Reviewed

AS DESCRIBED by Howard Millman ["Great XPectations," Technology, July 30], Remote Assistance in Windows XP is a P2P connectivity tool that "lets a user invite a coworker or guru to connect to his machine to resolve hardware or software problems. Requests for help are extended via an e-mail attachment that recipients just click on to initiate the connection." That description would send shivers down the spine of anybody remotely interested in security. An e-mail attachment that turns your computer into a hapless zombie? It appears that Microsoft decided to "embrace and extend" Back Orifice. Keep up the good marketing . . . oops, journalism.

Byron York
Systems administrator
Houston
lcypher@whoever.com

I WAS STRUCK by the undertone of Microsoft-bashing that came through in Howard Millman's review. It has been acceptable practice to continually attack Microsoft operating systems on their reliability, and to a certain degree, those attacks were justified by some instabilities and bugs in Windows 95 and 98. But Windows 98 SE, properly installed, is an extremely stable system that will go for weeks without problems. I can attest to that from direct experience at PBS, where, in a controlled 700-plus system environment, we had very few problems. Furthermore, with Windows 2000 (whether the desktop or server version), we have never experienced a crash or blue screen, period.

André V. Mendes
COO/CTO
Public Broadcasting System
Bethesda, Md.

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DON TAPSCOTT

Use the Net To Invest in Relationships

ONE OF THE BIGGEST challenges facing business leaders is identifying and nurturing relationship capital. This is the value of the relationships a company develops with its customers, suppliers and sometimes even competitors.

Relationships are now assets, giving rise to the discipline of "relationship capital management." Managers must know how to design the new relationships and exploit the wealth they represent.

While the virtue of deep customer relationships, for example, was always self-evident in theory, it wasn't a practical goal for large businesses prior to the emergence of the Internet. But now, coupling the Internet with enormous low-cost databases enables producers to develop a two-way, interactive, personalized, direct relationship with each customer.

Amazon.com is the most aggressive pioneer in this realm. A customer buys books online because it's cheap and easy to do. He can look up all books by topic or author. He can request a bestseller list in a particular category or ask for a book's daily sales status.

DON TAPSCOTT is president of New Paradigm Learning Corp. and co-author of *Digital Capital: Harnessing the Power of Business Webs* (Harvard Business School Press, 2000). Contact him at **dtapscott@digital4sight.com.**

Virtually every online retailer is now offering similar services. But Amazon goes further, developing a one-to-one relationship with each customer that fundamentally redefines the nature of the interaction. It used to be that sellers sold and buyers bought. Simple. But no more. Amazon can now get to know each customer, educate him, inform him proactively and deliver value-added services on a personal basis. For example, the company e-mails him when a new book fits his personal profile.

And the relationship goes further. The buyer creates value for Amazon and other customers by contributing his views on books he's read. Tens of thousands of Amazon customers grade books on a scale of 1 through 5 and write commentaries to justify their ratings. Other customers then vote on whether they find the reviews useful. Together, they dramatically enhance the value of the Amazon customer experience. In contrast, has Wal-Mart ever given its customers podiums in its stores so they could suggest to other customers what they should or shouldn't buy?

The Amazon.com customer also establishes a personal profile (or makes a "relationship investment") that includes registering gifts he would like to receive. The more time and effort he invests, the more personal the bookstore becomes. He builds loyalty to the company, not just because of the services it provides but because of the effort required to re-educate another company about his preferences. For both buyer and seller, this networked relationship constitutes capital. It has value. This value was amply illustrated when Amazon decided to start selling CDs in addition to books. Within months, Amazon became the world's biggest online seller of music.

Amazon's methods show why companies need a much more sophisticated approach to their customers. Customers aren't simply buyers of products. With the Net's arrival, they're an asset that can be developed. The deeper the relationship, the more valuable the asset. And unlike most other assets, relationship capital doesn't depreciate with use but actually grows in value. ◗

THORNTON MAY

IT Leaders Must Be the Key Messengers

DICKENS, MELVILLE and Aesop were no slouches when it came to telling stories. Unfortunately, many professionals in the technology arena aren't as skilled.

THORNTON MAY is corporate futurist and chief awareness officer at Guardent Inc. in Waltham, Mass. Contact him at **thornton.may@guardent.com.**

We all spend a fair amount of time at conferences and seminars. We all have the T-shirts, heavily logoed black canvas bags and booth giveaways to prove that we've been on the quest for truth. Are the words we're hearing worth the effort we expend to listen to them?

A poll of 30 IT leaders — ranging from übergeeks in the innovation- and performance-obsessed high-tech sector to battle-scarred, politically savvy veterans in the manufacturing sector to security/privacy- and customer-service-focused players in financial services — found a high level of concern about the state of messages and messaging in our industry today. Three questions immediately come to mind: Who is speaking for IT? Why are personally delivered good words so rare in our business? And why should we care?

Truth No. 1: The IT message is coming out of the wrong mouths. If you were to measure the total word count being generated about technology on the planet today, you would probably find that vendors and analysts are by far the highest-volume producers of the raw materials of oratory. The people who should really be talking, the users, are in most cases mute and on the wrong side of the microphone. Empirical evidence indicates that most vendors don't communicate to educate but to sell.

A classic example of inappropriate vendor obsession with selling vs. teaching was Tom Siebel's disastrous speech before about 400 IT leaders at last year's annual conference of the Society of Information Management in San Diego. Most of the attendees expressed anger at the sales content of the message from the CEO of Siebel Systems. It was the first time I've seen so many CIOs agree on anything.

Analysts are smart people who, due to their business models, must often tell incomplete stories. For instance, the security analyst tells the security story and the governance analyst tells the IT governance story. It's a rare company that has users who can select the best plot elements from each storyline and create the total picture of what end-to-end security looks like.

The call to action here: IT leaders need to write their own scripts. So the responsibility for crafting the message lies with you.

Truth No. 2: You must take time to sculpt a good message. The day-to-day pressures of our whack-a-mole-busy work lives don't afford us the time to choose our words carefully. "We don't have time to speak well," goes the argument.

The great orators of the 19th century had the time and took the time to craft their messages. They would take about 20 days to think about a speech, spend a week driving that thinking into narrative structure and then commit all of it to memory.

Call to action: IT leaders need to devote more time to making their messages understandable. Two tips for would-be technology orators: Don't use PowerPoint slides, and rehearse your speech in front of a tough audience before you go live with your message.

Business, particularly the business conducted at the top of the house, is based on oral communication. Isn't it time for IT leaders to do an oratorical upgrade? While many IT leaders have grad-school-level technological minds, they have ninth-grade oratorical skills. We live in an age when the quality of the words of IT has to reflect the significance of IT's contribution. ◗

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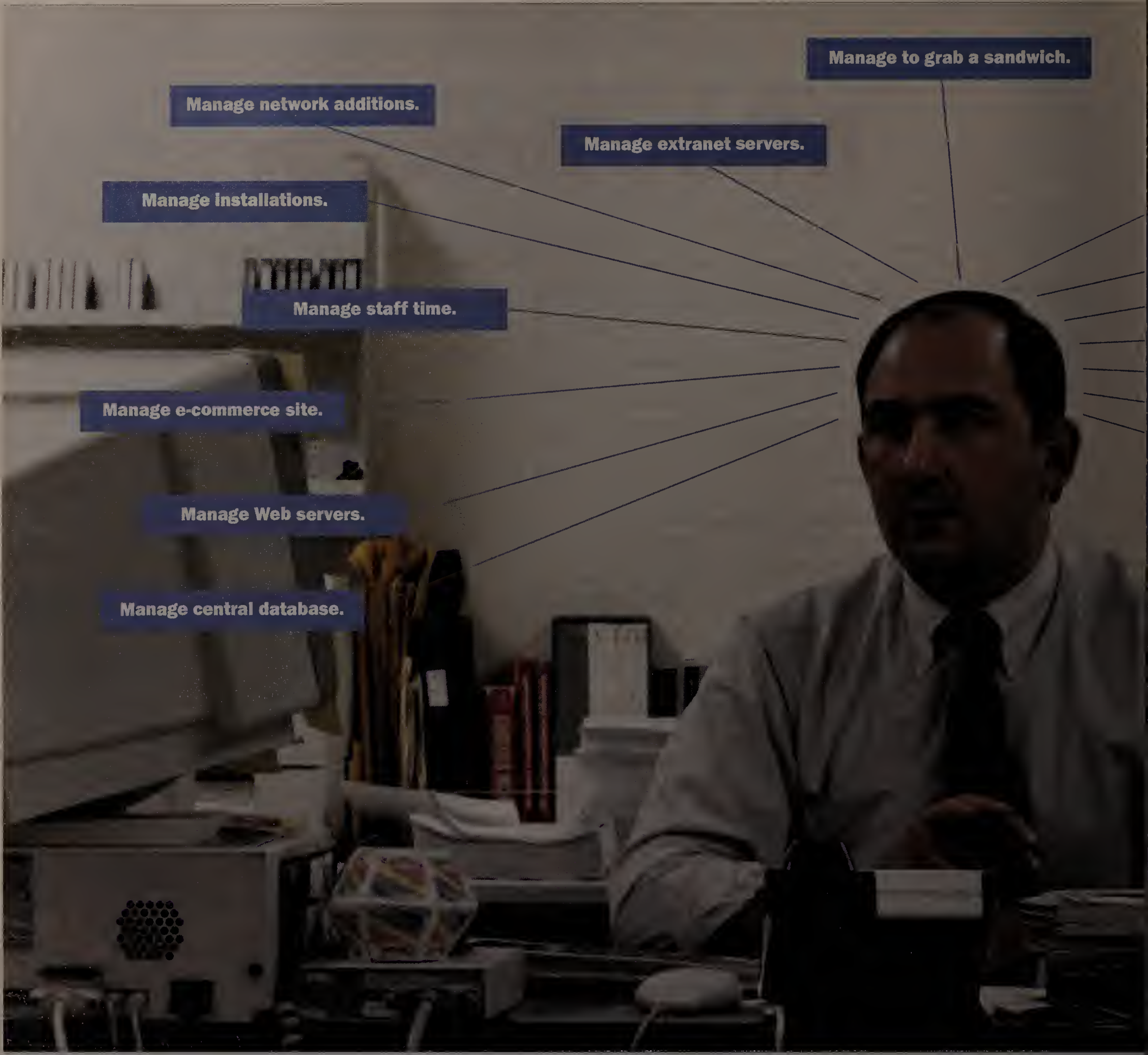
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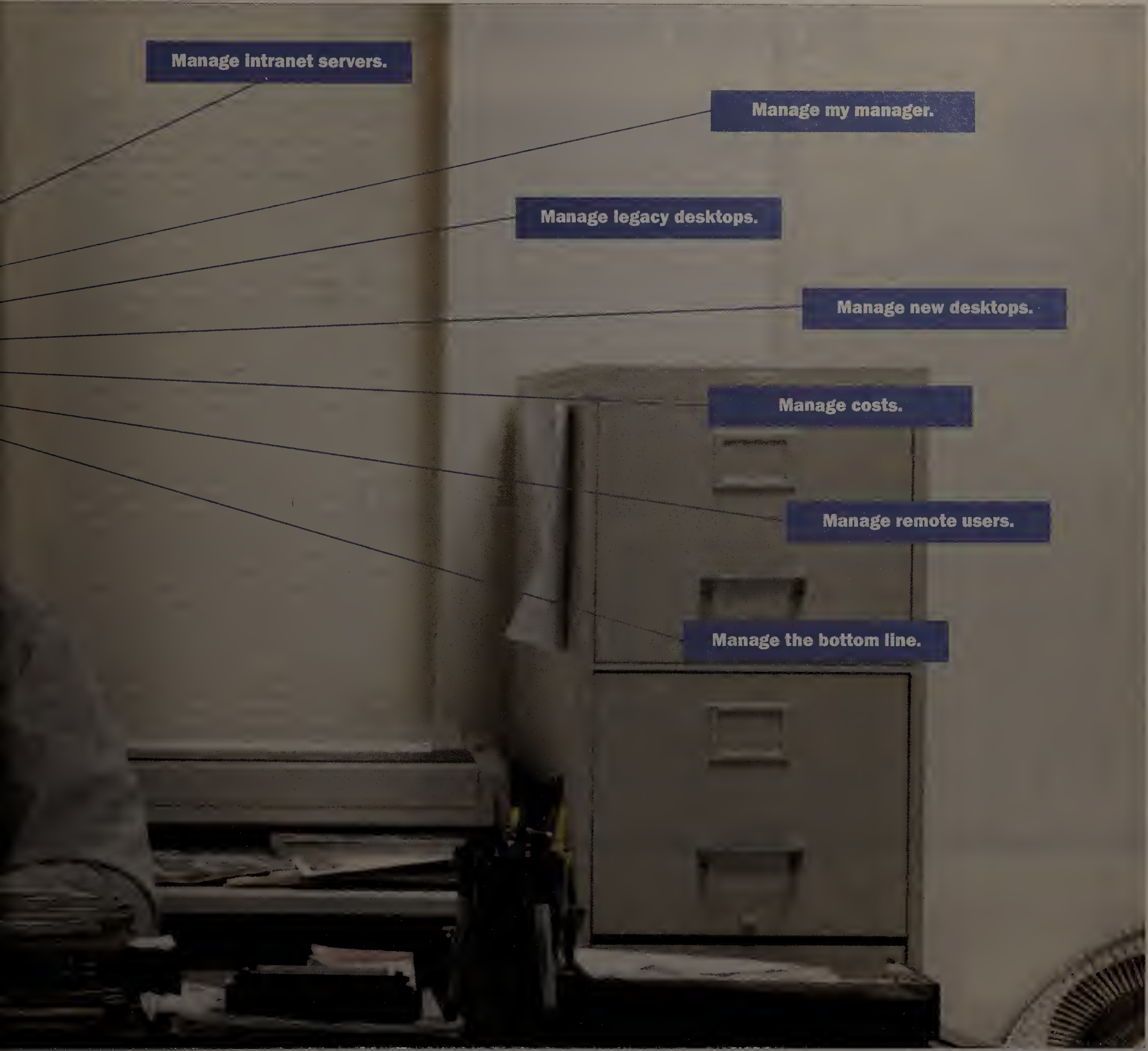

Active Directory™ service and Group Policy features in the Windows 2000 Server Family simplify management, strengthen security, and extend interoperability across both users and devices.

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THE POLITICS OF Privacy

With lawmakers pushing for greater privacy protection, IT managers are being forced to weave public policy into corporate data management processes. Here's a look at some of the steps that IT leaders in the heavily regulated financial services and health care industries have taken in response to those pressures. **By Mark Hall**

WITH THE POLITICS of online privacy escalating ever higher, IT managers are being forced to weave public policy into corporate data management processes. Ironically, the latest privacy regulations may actually streamline corporate data security procedures — but with a big price tag attached.

The most recent batch of laws affecting the information privacy policies and procedures of IT organizations are aimed at the financial services and health care industries. Although IT managers in other sectors might consider their organizations immune to these new laws, they may want to take a closer look.

For instance, the new laws are forcing banks, hospitals and other companies in these fields to consider third-party privacy policies as a criterion for doing business. This means that many companies that do business with financial services and health care firms — from medical equipment suppliers to online service providers — will need to be cognizant of the new rules.

PRIVACY REGULATIONS

These regulations could significantly change the status quo. The Health Insurance Portability and Accountability Act (HIPAA) requires, for example, that if a hospital changes its outside billing agency, the protected health information held by the "business associate," in HIPAA's terms, must be destroyed or returned to the hospital.

While the effects of HIPAA and the financial services overhaul legislation known as the Gramm-Leach-Bliley Act of 1999 are being felt only just now, new privacy legislation affecting a wider range of industries is being considered, according to the Center for Democracy and Technology in Washington.

Congress has already proposed more than 20 other privacy-related laws this term, most of which won't get passed and many of which pertain specifically to the privacy policies of government agencies. But the abundance of hearings, speeches and proposed regulations surrounding privacy clearly shows that lawmakers expect to play a more active role in this issue.

Regardless of the legislation that's on the table, politicians, IT managers and analysts generally agree that offering effective individual online privacy makes sound business sense. The latest legislation helps bear that out.

Lowdown on the Law

Although his organization isn't required to be fully compliant with HIPAA for another two years, Kerry Kerlin is already worried about the implications and costs of the act.

Kerlin is CIO at Erie, Pa.-based Saint Vincent Health System, a nonprofit hospital with clinics in 16 locations. He says that meeting the requirements for HIPAA will cost his company a "substantial" amount of money by the time the law goes into effect.

Kerlin says it presents a burden on three levels. First, the hospital will need to be able to audit all of its software to ensure that only authorized users are using it appropriately. That's tough enough for Saint Vincent's to accomplish with its own in-house applications, says Kerlin, but since the hospital predominantly relies on commercial software, he can't force vendors to make those kinds of changes. That means paying to have the software customized, acquiring a third-party authorization product or installing a new auditable application.

As a result, Kerlin says, he will need additional servers to handle the extra processing load from the new auditing software on his network.

By comparison, the financial services sector may have gotten off easy. The Gramm-Leach-Bliley Act, which obliterated many of the Depression-era barriers that once separated banks, brokerages and insurance companies, went into effect this summer and will be enforced by the Federal Trade Commission.

Under this law, financial services companies must disclose their information privacy policies in writing to customers each year and provide a form that allows people to opt out of data-sharing programs.

For most large financial firms, the Gramm-Leach-Bliley Act has helped IT executives get formal corporate approval for well-established privacy procedures. At the Bank of Hawaii in Honolulu, for instance, Gary Kahn got his company's longtime privacy policies approved by his board of directors in June, as the act requires.

Kahn, the bank's vice president and corporate information security officer, says complying with the Gramm-Leach-Bliley Act "was no big deal" for the bank, since there was nothing really new in any of the law's privacy procedures.

For example, he notes, provision 501B in the law requires banks to have an information security program in place to protect customers' personal data with techniques such as encryption. Kahn says current government regulations already require banks to have such a program.

"We already have a lot of controls on us," says Danny Raynor, senior vice president for enterprise information services at SunTrust Banks Inc. in Atlanta. He points to existing regulations on data privacy from government bodies such as the Office of the Comptroller of the Currency, which issued Web-specific privacy guidelines more than two years ago.

Nonetheless, neither Kahn nor Raynor view Gramm-Leach-Bliley as political window dressing. For example, SunTrust found some unexpected benefits in the regulations. Raynor says the $104 billion bank can now use a single set of guidelines when it audits third-party privacy procedures to ensure that it has basic privacy protection for its customers.

Meanwhile, the act spurred Bank of Hawaii to create its overarching information security program. Under this program, which Kahn heads, all privacy policies and processes are centrally managed on a single server. This means that any proposed business plan that makes use of customer information can be quickly checked to see if it's legal.

The adjustments Kahn and Raynor have had to make aren't unusual. In June, Zona Research Inc. in Mountain View, Calif., published a report on how privacy legislation affects IT operations. According to the survey respondents, getting the government involved in setting privacy standards was seen as very important to IT managers. Zona reported that 58% of the IT managers polled agreed or strongly agreed that "government should require Web sites collecting personal information to comply with minimum guidelines."

Zona analyst Susan Billheimer, who wrote the report, says the types of provisions found in Gramm-Leach-Bliley and other legislation can benefit companies because they provide an IT framework to protect businesses against expensive litigation.

The Price of Privacy

Large companies with hefty IT resources, especially in the heavily regulated financial and health care industries, aren't under particular duress because of recent legislation. But critics say existing and proposed regulations put an undue burden on small and midsize companies doing business online.

JOHN TI CHEN

GARY KAHN, vice president at the Bank of Hawaii, says complying with the Gramm-Leach-Bliley Act "was no big deal," since the bank already complies with most of the provisions in the act, but "smaller companies might not be as ready."

"A large company already has its privacy policies in place. A smaller company is terrified at the prospect," says Wayne Crews, director of technology studies at the Cato Institute, a Washington-based political think tank with libertarian leanings.

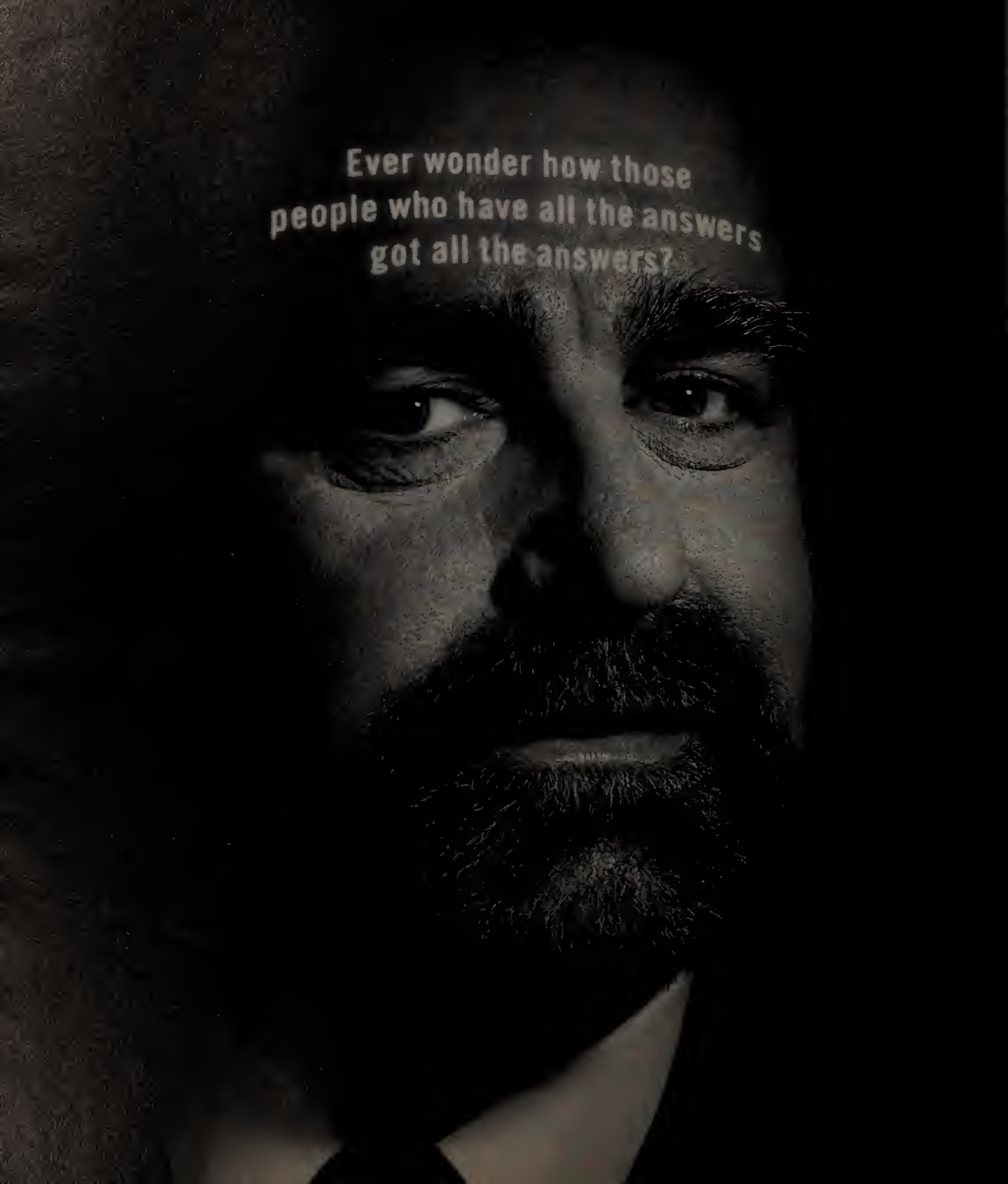
Kahn agrees. He says his bank already had virtually every aspect of Gramm-Leach-Bliley ready and then some, including a publicly available privacy policy, access controls to information and encryption of stored data, as well as extra physical security systems such as data centers equipped with "man-traps," which can seal intruders in entryways to areas that house systems. "Smaller companies might not be as ready," Kahn says.

Legislative privacy requirements such as Gramm-Leach-Bliley and HIPAA are leading IT departments to invest more in data security technologies. Gartner Inc. in Stamford, Conn., estimates that a mere 0.4% of a company's revenue is spent on information security today, but that figure is expected to jump tenfold to 4% of revenue by 2011.

At the Centers for Medicare and Medicaid Services, a Baltimore-based division of the U.S. Department of Health and Human Services, CIO Gary Christoph says he expects to spend a whopping $11 million on specific IT security measures in the current fiscal year, a figure that has more than doubled in the past three years. The funds will be used for everything from auditing applications for buffer overflows to hiring ethical hackers to check internal security processes, Christoph says.

Despite the clamor for new privacy laws, the public doesn't seem overly concerned, if the response to Gramm-Leach-Bliley's opt-out options is any indication. The returns are incomplete, but financial services companies have thus far received a piddling 0.5% to 0.75% response rate from customers demanding that all of their data be kept under wraps, according to Arabella Hallawell, a Gartner analyst.

"Privacy compliance is costing the industry millions, and the public apparently doesn't care about it," Hallawell says. ▶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CASESTUDIES

New federal requirements mean extensive IT adjustments for health care and financial services companies.

REID HORN

PAM McNUTT, CIO at Methodist Hospitals of Dallas, says complying with HIPAA is frustrating because the act is constantly changin

WHERE REGS MEET THE RealWo

HEALTH CARE

Making HIPAA Happen

Federal regs aren't final, but IT's jumping in. **By Kim S. Nash**

WHEN HEALTH CARE CIOs gather these days, the IT fallout from HIPAA is the main topic of conversation, says Pam McNutt, CIO at Methodist Hospitals of Dallas, a $275 million health care group that includes two large hospitals and four family medical centers in Texas.

Methodist Hospitals has no fewer than 13 committees that study the various aspects of the Health Insurance Portability and Accountability Act (HIPAA), which is a set of federal regulations intended to protect and simplify the exchange of health care data and save the industry money.

In the works since 1996, HIPAA "is touching a lot of people," McNutt says.

Three of the four main parts of HIPAA have been finalized. They deal with how transactions and data exchange among health care companies must be formatted, what unique identifiers for medical transactions should be used and what privacy and confidentiality standards must be in place.

But the part that will most affect IT departments — security — has yet to be completed. It's expected this fall, and then companies will have until April 2003 to comply.

Even so, Methodist Hospitals has gotten a jump on some parts of HIPAA's draft security provisions. That's because many of the new regulations are practices that smart IT groups should already be implementing, McNutt says.

For example, HIPAA effectively calls for every user to have a unique user name. Networks must be monitored for intrusions, and e-mail must be encrypted when it contains patient information.

Much of that is already done at Methodist Hospitals, McNutt says. But one upcoming job for the company is to make sure all users, even those in smaller departmental systems, have finely delineated role-based access to data. The goal is to reduce "catch-all" sign-ons, McNutt says, which can give some users access to patient data they don't need to do their jobs.

Nurses, laboratory technicians and pharmacists, for example, may need to see some, but not all, of the same patient information. McNutt's IT group must sort that out, mainly through careful manual labor. Her staff is now working to identify and define all of the various roles of the users of Methodist Hospitals' systems.

The company doesn't plan to use directory technology. Rather, it will rely on the data-access security options built into the key clinical and administrative applications Methodist Hospitals already uses.

"We may find that an application we've purchased doesn't allow [the needed data-access] granularity in security. That will be a dilemma," McNutt says.

"The big balance for health care is giving people only the information they need but making sure we haven't locked things down so tightly that it's too cumbersome to get to critical patient data in a hurry," she adds.

Some HIPAA specifics, however, are in flux. The draft changes frequently as lobbying groups and other interested parties weigh in on the security proposal.

McNutt says she wants to be scrupulous in adhering to the letter of the law. But since it's still in draft form, there's only so much her IT staff can do. "It makes it difficult to move forward when you're looking at a moving target," she says.

To keep frustration levels down among her employees, McNutt says, she's waiting out any HIPAA rule that seems unreasonable (see story at right).

Next up for McNutt are upgrades to the hospital group's networking equipment. She plans to give 536 physicians tokens that generate passwords on the fly to further secure access to the company's wide-area network from doctors' offices and homes.

She also plans to use more of the features in her existing network-monitoring tools — such as Hewlett-Packard Co.'s OpenView — to get a fuller picture of traffic to and from the hospital group's 27 Windows NT servers, various midrange systems and IBM mainframe. Part of that project will be to upgrade older switches and routers from Cisco Systems Inc. with newer Cisco gear that includes built-in intrusion-alarm systems.

Already well under way is an effort to upgrade all hospital software to the latest releases. That primarily involves administrative and clinical systems from Siemens Medical Solutions Health Services Corp. in Malvern, Pa., and Cerner Corp. in Kansas City, Mo.

HIPAA, page 40

HIPAA's Internet, IT Implications Remain Fuzzy

The Health Insurance Portability and Accountability Act (HIPAA) was created to standardize and simplify the use and management of patient data in all of the various companies and organizations in the health care chain.

But for many health care companies, HIPAA is far from clear.

HIPAA listservs carry dozens of e-mail messages every day from compliance officers, lawyers, IT managers and others asking questions of peers and seeking to clarify HIPAA's sometimes confusing language.

Some of the new rules would seem to have dramatic implications for IT managers. As written, several regulations are widely considered too onerous by the health care industry – and therefore may be deleted or changed by this fall. They include the following:

- **Companies must track access to records by patient and by the user doing the accessing.** Few packaged software products for the health care industry can do that to the level HIPAA would seem to demand, says Pam McNutt, CIO at Methodist Hospitals of Dallas.
- **Companies must get written consent from patients before recording information about them in a computerized system.** One implication: A patient's consent must be obtained before the routine scheduling of appointments or tests.
- **Companies must secure not only electronic patient data, but also information about patients that's in the form of paper or voice.** "How do you absolutely secure the voice, like in an elevator when people are talking [about a patient]?" McNutt asks. She says she expects paper and voice provisions to be omitted from the final version of HIPAA.

The American Hospital Association in Chicago wrote to President Bush in May to urge that some of these provisions be changed, including coverage of oral communications and consent for standard uses of patient information.

In some ways, HIPAA will be outdated even before it's finished. The rules were designed mainly to deal with batch processing, not with individual Internet transactions, McNutt notes.

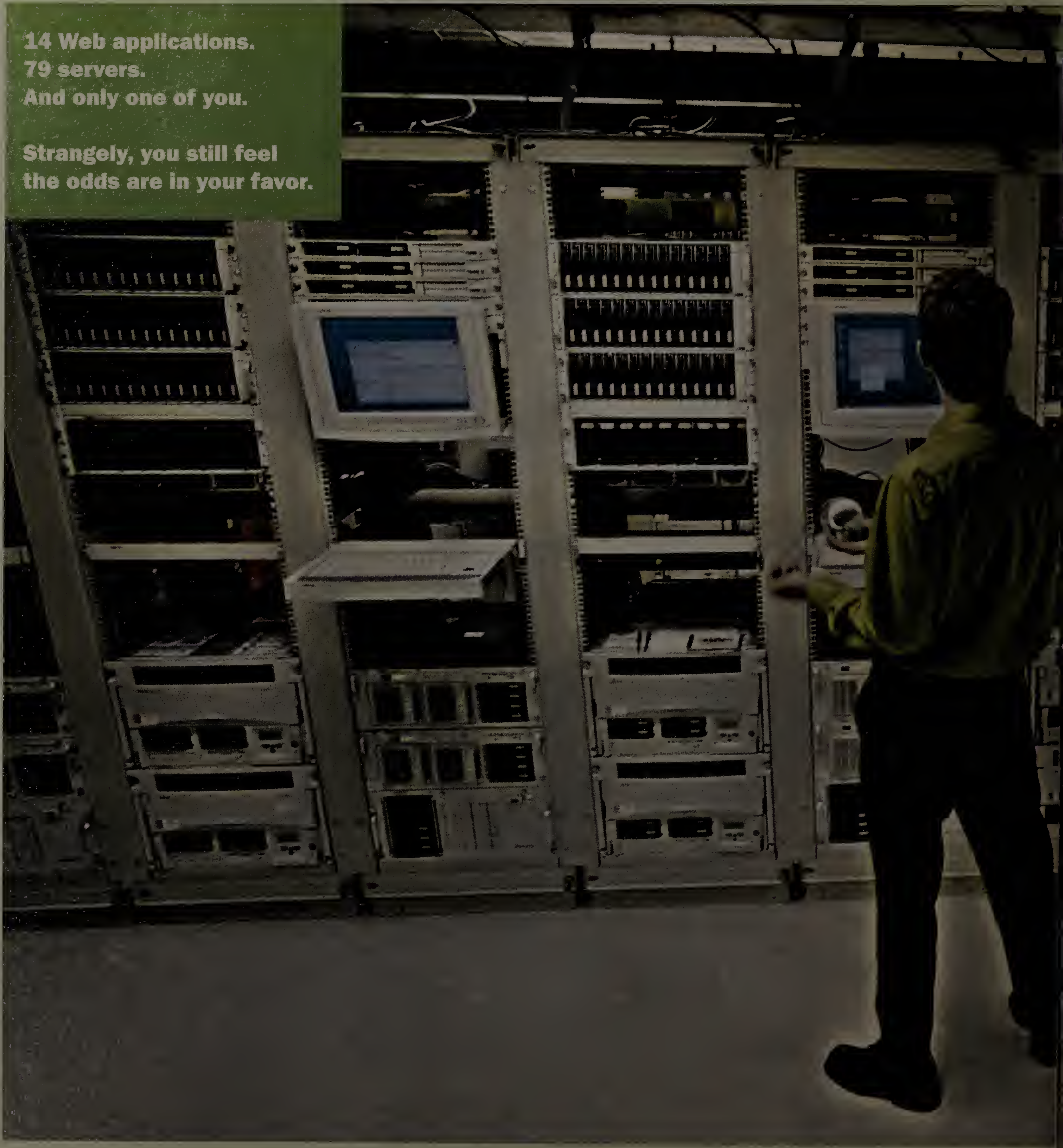
But more and more companies involved with health care operations must contend with the Internet, particularly insurers that offer customers online access for tasks such as checking benefits. Plus, some health care firms want to use secured extranets to communicate with one other, and many doctors already communicate with patients via e-mail.

HIPAA's guidance regarding Internet transactions has raised a lot of questions in the health care industry. In essence, HIPAA says that not all Internet transactions must comply with all HIPAA rules.

The U.S. Department of Health and Human Services (HHS), the federal agency overseeing HIPAA, tried to clarify the rule last month. HHS said, for example, that if someone uses a browser to enter data onto the server of, say, an insurance company, that's considered direct data entry and isn't subject to the HIPAA rules for how transactions must be formatted.

Methodist Hospitals, like most hospitals, isn't putting much, if any, patient data online. "Fortunately, for now, we don't have to worry a lot about what HIPAA doesn't say about the Internet," McNutt notes.

– Kim S. Nash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Web server farms have always been known for providing high application availability in a cost-efficient manner. Unfortunately, in the past they have also been known for manageability headaches. But no more: Microsoft Application Center 2000 now makes managing Web applications and groups of Web servers as simple as managing a single server.

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MARKET FACT

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--Mike Bodnar, Production Services Manager, Terra Lycos

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Continued from page 37

The Siemens applications are more HIPAA-sensitive because they include patient registration, order entry, billing and other modules through which patient data gets passed outside Methodist Hospitals to other health care entities, McNutt says. That sort of data exchange is at the core of HIPAA.

"By having the latest releases installed, we'll be ready to go with HIPAA patches when they come out," she explains.

McNutt says she's been able to talk most vendors into providing free HIPAA compliancy updates when renewing contracts.

One key piece of HIPAA work doesn't involve hardware or software: McNutt's IT group is helping create a one-page document to give to patients that explains how their private data is handled and the protections they can expect. ◗

FINANCIAL SERVICES

Customer Control Is Costly

Providian spent 18 months and millions of dollars on Gramm-Leach-Bliley.

By Lucas Mearian

MARC LOEWENTHAL, chief privacy officer at San Francisco-based Providian Financial Corp., was recently confronted with figuring out how to get four affiliates and dozens of business units on the same page to share customer information while complying with new federal laws.

The task of meeting the requirements of the Financial Services Modernization Act of 1999 was an 18-month, multimillion-dollar process that entailed sending mailings to 14 million customers, developing an enormous client privacy database and creating a set of business rules that would ensure its use.

Also known as the Gramm-Leach-Bliley Act, the statutes passed by Congress were designed to break down the Depression-era barriers that have separated the business activities of banks, brokerages and insurance companies. The act also requires financial services firms to allow customers to opt out of sharing their personal information with unaffiliated third parties and to put in place adequate security for the protection of that information.

As a result, during the past two years, financial services companies have been forced to spend hundreds of millions of dollars mailing their privacy policies along with opt-out statements to customers, only 1% to 5% of whom bothered to reply.

In many cases, compliance has meant creating a single, centralized database of customers who chose to opt out that's to be shared among all business units and affiliated companies within a given corporation. In other cases, companies have created privacy databases, separate from those in other business units, that are accessible to marketing and promotions departments.

Loewenthal says Providian spent "several millions of dollars" sending mailings to its clients, as well as updating and consolidating almost a dozen databases in order to create a single privacy database that can be shared by affiliates First Select Corp., First Select Inc., GetSmart.com Inc. and Providian Bancorp Services.

The customer mailings — little more than an additional bank statement sent to Providian's 14 million customers — went smoothly, according to Loewenthal. What was time-intensive, he says, was combing through vendor contracts to discover what information was being shared and with whom under those agreements, and who among the various companies controlled access to client data.

"Like other financial institutions, we convened the appropriate committees and did appropriate assessments. That went fairly smoothly," Loewenthal says of the discovery process. "What we really had to do was create a data warehouse that housed opt-out requests from each of the affiliates' customers."

Providian consolidated information from nearly a dozen disparate databases into a single privacy database. But Bank One Corp. in Chicago consolidated more than 40 databases into one to ensure that privacy could be maintained across all business units and affiliated companies, according to spokesman Stan Lata. The total cost to the bank was in the "tens of millions of dollars," he says.

"We built our own [database] system but worked with an outside company to develop matching engines," Lata adds.

Providian has initially set up business rules to make sure that before any marketing or promotions can go forward, its mailing lists are cleared through the privacy database.

Gramm-Leach-Bliley also requires that security be robust enough to guarantee that customer information is shared only with the appropriate parties. Providian has "always made certain its external firewalls were in good shape," Loewenthal claims.

"What [Gramm-Leach] set in motion for us and others is to figure out how information should be handled internally so you can be certain only those who need access to certain information have it, and to have a way of monitoring that access to information so you know exactly who can do what with what at any given point in time," he says.

Now the challenge is to create relational databases that, like those at Bank One, will automatically track how information is shared and who can solicit customers, Loewenthal says. That project will take months to "spec out," he says, tying up "significant amounts of the business and systems [department's] time."

For many financial companies, getting business units to share customer information has been a struggle because some salespeople consider their hard-won lists proprietary, analysts and industry experts say.

> **"**
>
> **What [Gramm-Leach] set in motion for us and others is to figure out how information should be handled internally so you can be certain only those who need access to certain information have it.**
>
> **MARC LOEWENTHAL, CHIEF PRIVACY OFFICER, PROVIDIAN FINANCIAL CORP.**

Providian's business units already had a "much more symbiotic relationship," making the sharing of information easier, "but nevertheless, it was still a challenge to segment consumer preferences in order to be able to honor their privacy choices and be able to market products and services," Loewenthal says. "We're setting up an in-house auditing and monitoring process to make sure those requirements are met over time."

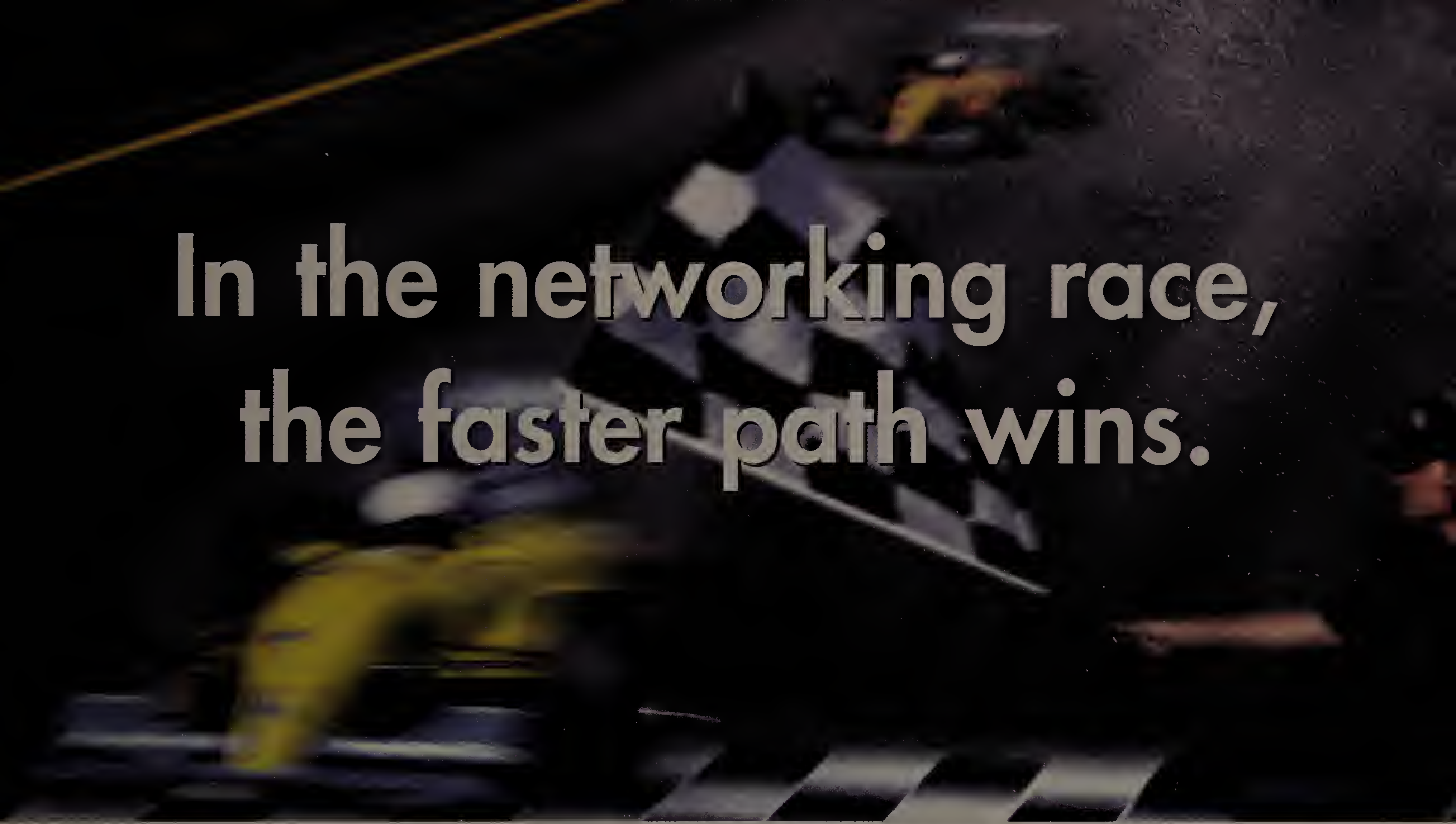
More troublesome to Loewenthal is the possibility that pending congressional legislation could add "opt-in" rules, requiring companies to receive customers' explicit permission to share their information.

So far, financial services companies have spent about $400 million on updating IT systems and identifying customers and unaffiliated third parties with whom they may share data, in response to Gramm-Leach-Bliley, according to market research firm TowerGroup in Needham, Mass. The total cost of compliance with the new legislation could swell to three times that figure and could skyrocket to Y2k-spending proportions if Congress mandates opt-in rules.

"Estimates made by various organizations show that opt-out may cost institutions $10 per customer, but an opt-in requirement could be $30 or $40 per customer," Loewenthal says.

On top of that, Gramm-Leach-Bliley doesn't preclude states from enacting their own, stricter laws.

"Right now, we have [Gramm-Leach-Bliley], which has clearly presented businesses with a number of regulatory challenges that need to be observed," Loewenthal says. "I think the most havoc will be created by what the states do." ◗



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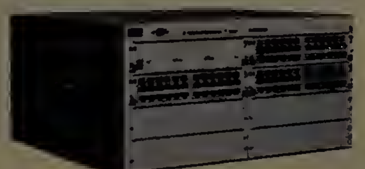

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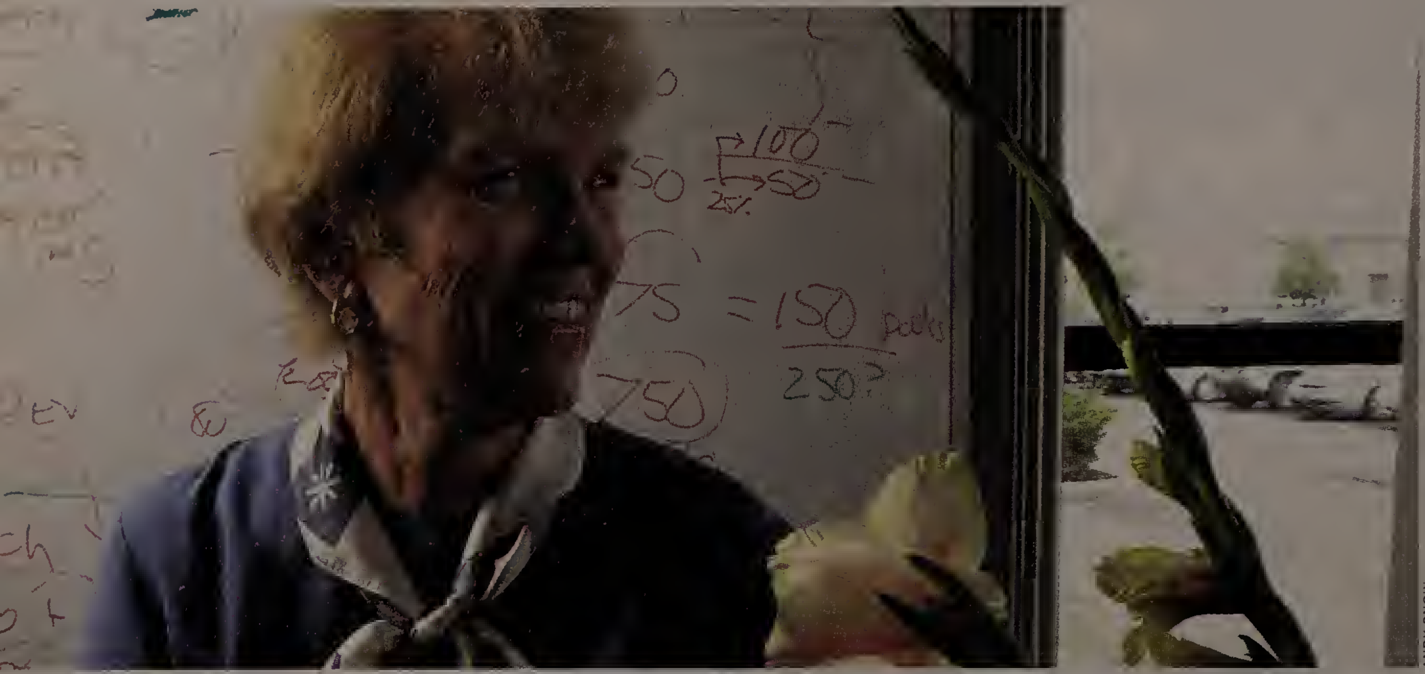
WHERE CREDIT'S Due

Budget cutbacks in IT have reduced training investments at many companies. That's why proponents of a technology training tax credit are optimistic about two pending pieces of federal legislation. **By David S. Bernstein**



CAROL CLARK, president of MindLeaders, says a federal IT training tax credit would give companies more for their money.

ANDY SNOW

When budgets get tight, training is often on the chopping block early. Yet the long-term objective of creating a highly skilled workforce remains a key goal for many in Congress.

TAX CREDITS

So although a federal technology training tax credit has failed to gain passage within the past couple of years — and despite the layoffs that have quelled much of the talk of skills shortages — proponents are gearing up to try again.

Identical bills have been introduced in both the House of Representatives and the Senate that call for a revision of the Internal Revenue Code to allow companies and individuals to get back some training costs as tax credits. Companies would receive 100% of IT training program expenses of up to $1,500 per employee. In addition, individuals would get a tax credit under expanded versions of existing Hope Scholarship and Lifetime Learning education credits.

A spokesman for Sen. Kent Conrad (D-N.D.) says it's too soon to tell whether the bill will pass but is optimistic that it will fare better than it did last year, when it died in the committee phase.

"There's a huge shortage of IT-trained individuals in this country," says Carol Clark, president of MindLeaders, an online training provider in Columbus, Ohio. She says many companies tell her that they have heavy training needs but must postpone them for budgetary reasons.

"It's been my experience at companies that, often, training is a piece of the budget that is the first to get reduced," agrees Penny Geld, customer care training manager at network services provider Genuity Inc. in Woburn, Mass.

A tax credit for training expenses would help keep training alive in companies' budgets, according to Geld. "This is a way to show immediate return — it shows up on the bottom line, where normally, it's very hard to measure return on investment in training," she says.

"[Companies] are just going to get more training for their money" if the law passes, Clark adds.

Unanswered Questions

One concern Clark says she heard from people when she lobbied for the bill last year is that the credit will be used primarily to upgrade the skills of existing IT workers rather than to bring new workers into IT fields.

That's just one of many questions about implementing the idea, Geld says. For example, what skills are worth reimbursing? What training providers should qualify? How do you value training that's provided internally, as much of Genuity's is? "We do a fair amount in-house and typically do not have a chargeback, so how does the tax credit apply?" Geld asks.

Some people might not like all of the provisions in the bill as it's currently written. For example, the bill defines "information technology training program" as "a program for an industry-accepted information technology certification." But only a portion of IT training is for certification.

The bill specifies that a wide variety of training providers can be used, including state training programs, school districts, university systems or certified commercial technology training centers. But some state IT training tax credit efforts, including one recently passed in Arizona, don't recognize private commercial training providers.

This year's federal bill drops an attempt to create a separate, new tax credit for individuals. Instead, it proposes to amend the existing Hope Scholarship and Lifetime Learning credits to add commercial IT training providers to the list of eligible educational institutions.

On a separate front, the Alliance for Small Business Investment in Technology in Arlington, Va., has introduced legislation to help offset small businesses' technology costs, including IT training. Meanwhile, the set-aside funds from the H-1B visa program, intended to pay for domestic technology training programs, will soon start being granted.

Unanswered is the overriding question of scope — that is, whether every computer-related training course will be covered, or just those considered to address "critical skills." The bill instead calls for the creation of an advisory board to make a list of certifications it deems worthy of the credit, but it provides few guidelines regarding how the board should make its decisions.

But if all of these questions are answered, the training bill may be able to address a question Gelb finds herself asking at Genuity: "We send a tremendous amount of technical work overseas — why aren't we keeping that here?" ◗

Bernstein is a freelance writer in Waltham, Mass.

IMMIGRATION Glut?

The economic downturn this year has raised concerns over the quota for H-1B workers. Many visa holders continue to enter the U.S., even as others find themselves out of work and forced to go home. **By David S. Bernstein**

DANNY TURNER

ABID ADEBI, CEO of Dallas-based technical staffing firm The Adea Group, says, "At this time, we have a glut of people with H-1Bs with nowhere to go."

As the economy has turned sour and high-tech firms have shut their doors or announced mass layoffs, thousands of foreign-born workers holding H-1B visas have lost their jobs and thus their right to remain in the U.S. Many must now return to their home countries.

At the same time, thousands of workers are still receiving new H-1B visas, allowing them to come to the U.S. for employment. Foreigners can obtain the immigration visas if employers sponsor them for skilled jobs.

To Abid Adebi, CEO of The Adea Group, the result is a very poor trade for the U.S.: We are, in effect, swapping trained workers for untrained ones, he says.

"We have already spent the time and energy to train these people in the American ways of doing things. Rather than bring new people, I'd rather see an extension for the people who are already here," says Adebi. His Dallas-based firm, which recruits and provides IT talent to businesses in the Southwest, employs some 600 people, nearly half of whom are H-1B visa holders.

Less than a year ago, at the urging of the IT industry, Congress increased the number of H-1B visas from 115,000 to 195,000 per year through 2003 — after having raised it from 65,000 just two years earlier. The argument for doing so was that the U.S. faced an enormous skills gap that could be filled only by importing talent from abroad.

H-1B VISAS

But it seems like a different era now. With more available workers and fewer job openings, the increased visa numbers look hopelessly outdated.

"Across IT, [employers] have for the first time been able to be very choosy and not just take anybody who could spell *Java*," says Adebi. "At this time, we have a glut of people with H-1Bs with nowhere to go."

Adebi, who came to the U.S. 20 years ago and has since become a citizen, says he empathizes with the visa holders who are suddenly finding themselves jobless and homeless.

> **"Rather than bring new people, I'd rather see an extension for the people who are already here.**
>
> **ABID ADEBI, CEO, THE ADEA GROUP**

The average age of the H-1B workers he employs is 25, Adebi says. "Most of them don't really know how to deal with a downturn," he explains. "These people walked into an $80,000 job, and all of a sudden, it's completely changed."

Detractors have argued all along that IT employers had no need for the increased visa quota. The true impetus for the call for immigrant workers, they say, was to drive down IT wages, especially at software firms, which employ the largest number of H-1B applications in IT.

Regardless, H-1B visa holders — perhaps as many as half a million in the U.S. today — are stuck between a rock and a hard place if they're downsized out of a job. For starters, they're easier to fire, since they're legally "at-will" employees. In addition, any new jobs they take must meet the requirements of H-1B visa rules, which state that H-1B holders must work at specialty occupations only.

New portability rules have made things easier, however, by allowing them to start a new job without applying for a new visa.

Worst of all, is that for many visa holders, their employers were helping them through the citizenship process. Many H-1B holders are racing the clock to receive permanent status within the three years before their temporary visas expire. Without an employer's sponsorship, that becomes very unlikely.

Meanwhile, as Adebi points out, 195,000 new H-1B visas could be handed out this year, although so far, the actual numbers have been lower than the cap.

Lowering that cap, however, seems a tough sell, despite the economic downturn. For one thing, politicians are beginning to sense the impossibility of keeping pace with the volatile marketplace for high-tech workers. The bump to 195,000 probably came two years later than the need for the workers and may have exacerbated what some see as a worker glut. Another change might come back to haunt legislators in the same way.

In fact, while IT managers contacted for this article were reluctant to speak in favor of maintaining the increased H-1B cap of 195,000, none was willing to speak in favor of reducing the cap, either. ◗

Bernstein is a freelance writer in Waltham, Mass.

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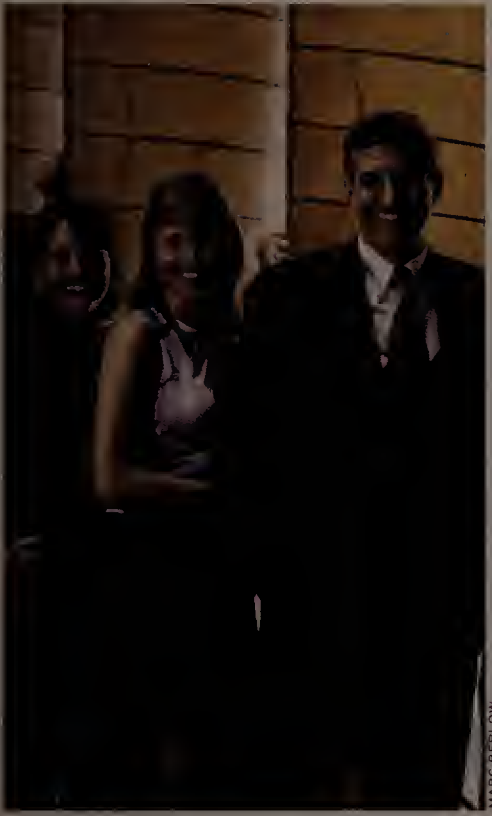

MARC BERLOW

DUKE OF E-BUSINESS

In January 2000, Duke Energy unleashed a group of e-business proponents throughout the company to seed pilot projects and provide guidance. The net effect: $52 million in cost savings. **PAGE 48**

IT MANAGERS' FIDUCIARY DUTY

Fiduciary responsibilities usually refer to the obligations that a stockbroker or banker has to protect and educate his clients about their investments. But even IT managers have accountability, to ensure systems performance and reliability to customers, employees and shareholders. **PAGE 50**

BEWARE OF SUBLEASING GOTCHAS

Companies should insist on having the right to sublease equipment without the lessor's approval of your sublessee, advises Joe Auer. **PAGE 52**

ED YOURDON

Keep Lawyers in Loop

A LARGE MAJORITY OF IT DEVELOPMENT PROJECTS end up as failures, in terms of missed deadlines, blown budgets and dissatisfied users. And while many of the IT projects carried out by external vendors do have the contractual equivalent of a prenuptial agreement that covers how the two sides would “divorce,” neither party ever seems prepared for the messy legal aftermath of a failed project.

When I tell project managers that litigation costs in large IT organizations will likely exceed the cost of coding, they're shocked. And well they should be, for while they have often devoted great care and attention to coding (along with all the other technical activities associated with systems development), they tend to ignore the legal issues until a lawsuit is staring them in the face. By that time, it's usually too late to prevent the consequences of mistakes that occurred throughout the project.

Reasons for this include ignoring or excluding lawyers during the negotiating and contracting stages of an IT project; asking them to draft elaborate provisions for technical issues that they don't understand; or letting them create contracts whose terms and conditions turn out to be unworkable from the beginning and that both parties proceed to ignore without bothering to inform their legal advisers. While there are exceptions to this dismal assessment, the prevailing situation is that the *conduct* of the project takes place — often over a period of months or years — without any legal review, oversight or guidance. Then, when things blow up at the end, and the vendor and customer angrily blame each other for having caused the problem, it's often an entirely new set of attorneys who are brought in to serve as hired guns to help orchestrate a legal punishment on the other side.

Interestingly, the resulting lawsuits tend to focus on very esoteric, sophisticated technical issues, such as the question of whether the vendor succeeded in delivering a system whose “cyclomatic complexity” (the amount of decision logic in a single software module) exceeded industry norms, even though neither party had ever heard of this metric of software maintainability before the lawsuit was filed (see *www.mccabe.com/products/qa_method.htm* for more details, if you're curious). And while the lawyers, the jury and the judge are all grappling with the nuances of this technical buzzphrase, the real problem usually turns out to be far more basic: There was no contract at all; there were no tangible, objective acceptance criteria that described when the project could be considered finished; or the contract was emasculated and renegotiated during the course of the project, but without any written record of what was agreed to, and under what circumstances.

Ironically, the only time that most IT organizations decided to pay attention to their lawyers was during preparations for Y2k. As it turned out, there were very few Y2k problems that were serious enough to cause lawsuits. But I know from experience that many IT managers were pleasantly surprised by the pragmatic, common-sense advice they received from their lawyers: “Develop a *process* for doing your Y2k remediation work,” the lawyers said. “Document the process, in case you need to explain it in a lawsuit. Make sure your project teams actually follow the process, and provide an audit trail to demonstrate that they did so.”

Bottom line: If you're responsible for a large project, get your lawyers involved as business partners. *Keep* them involved during the course of the project and use them as a form of risk management. If you're lucky, you may never need their assistance in the project's aftermath. But in the worst case, if you get involved in a lawsuit, you'll be happy that you got them involved earlier rather than later. ▶

ED YOURDON is editor of *Cutter IT Journal*, published by Cutter Consortium in Arlington, Mass. Contact him through www.yourdon.com.

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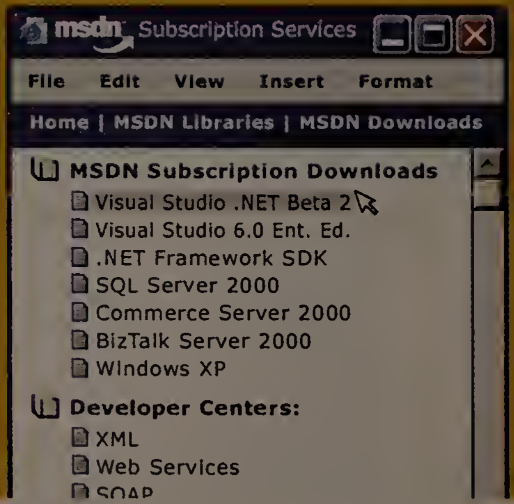

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E-NERGIZING THE COMPANY

How a small band of visionaries incubated e-business throughout Duke Energy. By Kathleen Melymuka

On the first business day of the new millennium, Duke Energy initiated a guerrilla approach to e-business. A small band of advocates began to roam the utility, living in the business units, seeding pilot projects, assisting with implementations, coordinating resources and spreading success stories.

Eighteen months later, having launched more than a dozen successful Internet initiatives that saved the company $52 million last year alone, the "e-team" is now handing off the projects to the businesses.

"Then," says senior vice president and chief e-business officer A.R. Mullinax, "we will declare victory."

Here's how they did it:

In late 1999, Duke's corporate policy committee, at the urging of CIO Cecil Smith, authorized Mullinax to begin to harness the Internet. "Our CIO really understood the Internet space and the impact it was going to have on business," Mullinax says. "He deserves the credit for really awakening Duke."

The goal was to weave e-business into the Duke fabric. "We didn't want to turn Duke into a dot-com," Mullinax recalls. "We wanted to find uses of the Internet that would advance our existing business."

Mullinax, then senior vice president for procurement, was given free reign to recruit a team and carry out the mission. He chose Ted Schultz from strategic planning, Steve Bush, finance and administration; Dave Davies, IT project management; Amy Baxter and Dennis Wood, procurement; Elizabeth Henry, customer focus; and Anne Narang, Web design.

"Everybody brought strengths to the table," Mullinax says, "and the other ingredient was chemistry. We worked well as a team."

From the start, the team planned to disband in 24 months. "You should get to the point where you don't need an e-business officer any more than you need a chief telephone officer," Mullinax says.

The team spent the first month getting a good perspective on the Charlotte, N.C.-based company, which ranks 17th among the Fortune 100. Then, team members literally moved into the businesses. If a unit had already launched an Internet initiative, a team member would advise on strategy and implementation. If a unit was new to the Web, a team member could spearhead an initiative.

'INVEST LITTLE, SAVE BIG'

The e-team had a budget, but its mantra was "invest little, save big." It looked for business units that could use Internet tools in the most effective way, particularly those units where customers were dependent on information and easy access to that information would add value to the relationship.

"We could have taken on hundreds of initiatives, but we looked for the ones that would give us the most return compared with the level of effort it was going to take," Mullinax explains.

Duke officials declined to disclose the operating budget for the e-team, but it was able to fund pilot projects, which helped make the e-business initiatives even more attractive to business units, and leveraged existing online tools among several businesses, making them virtually free for users. "We let them put their toes in the water," says Wood, "and then if they liked it, they could jump in later."

Henry worked at Duke Solutions, which advises very large industrial, commercial and institutional customers, such as Northfield, Ill.-based Kraft Foods Inc., on energy management. "I was attached at the hip to [Duke Solutions'] e-business strategist [Jeffrey Custer]," she recalls. "It worked so well to be with them, hearing what their issues were every day."

Custer, director of corporate development at Duke Solutions, agrees. "You have a fear when you hear that corporate is going to create a new group, but they were different," he says. "I was the lead; they were here to provide support and seed money. They kept the focus and kept me moving."

Meanwhile, Schultz worked with Duke Energy Trade and Marketing in Houston, which provides energy to very large customers, such as city power companies. Henry and Schultz correctly suspected that the needs of the two customer sets would be similar. The e-team members funded and helped the businesses stage comprehensive focus groups to gather information on what customers wanted. That turned out to be a customizable Web page where clients could receive services like online billing and account status as well as energy industry information.

Custer says the focus groups made a big difference. "I had some fantastic things I wanted to put on [the site], but the customers said, 'That's great, but this is what I need today,' " he says.

The e-team funded the prototype, and the businesses provided coding and content-generation services. Within 90 days, Version 1.0 of *my.duke-energy.com* was up and running.

NO FEAR

The iterative, 90-day cycle was a hallmark of the e-team, and it kept them in touch with customers. "When you go off and work on something for six months, even if it's bad, you've invested too much, so you try to put the round peg into the square hole," Custer says. "But their [strategy] was ask the customer, prototype it, show it to them, make changes and do it again; keep it moving. You get a lot more feedback and buy-in that way."

"We weren't scared to fail," Henry recalls. "We had to make fast decisions, [and] some wouldn't work. Our job was to try things and learn from our mistakes." For example, when the original portal prototype didn't meet performance expectations, "we trashed it, and in six to eight weeks, we were up on a different software," she says.

While Henry and Schultz worked on the customer portal, Wood brought online auctions to Global Sourcing, Duke Energy's procurement unit. Working with FreeMarkets Inc., a Pittsburgh-based online auction company, Wood also explained the process and benefits to supply chain folks throughout the businesses. More important, he invited them all to the first live auction in May of last year.

Says Wood, "You can explain things all day long, but when they see it, it clicks."

The e-team kept its view broad and fresh with Monday morning meetings. "We'd get together to share war stories, talk about what we were hearing and about opportunities," Wood says.

For example, Davies' project management portal was developed to facilitate collaboration and document sharing for Duke Engineering & Services, but other businesses were soon eager to leverage it.

About six months in, business people spontaneously started attending e-team meetings, and collaboration increased. "There have been a lot of things we've picked up that I never would have known," Custer says. For example, when he learned about the online auction, he leveraged the technology to help one of his Duke Solutions' commercial customers save 30% on a natural gas contract.

Top management is proud of the e-team's results. "E-business has helped accelerate cost savings, [and] we are also seeing performance enhancements," said executive vice president and chief administrative officer Ruth Shaw in a speech at a utility forum late last year.

Duke's stock price has nearly doubled since the initiative began and is currently hovering in the low 40s. Though there are many reasons for the stock's uptick, the e-business successes have contributed, say Wall Street analysts.

"Leading in technology helps maintain the image of market leadership, which is one of the factors that caused stock price to do so well," says Tom Hamlin, an analyst at Glen Allen, Va.-based First Union Securities Inc.

The team's success was built on strong support from executive management, the ability to hand-pick members, a crystal-clear mission, good communications, strong relationships throughout the business and freedom from red tape.

"It's been an opportunity to demonstrate that you can influence the company with a small team positioned in the right way with the right message, delivered effectively," Mullinax says. "It's been very rewarding. And it's been fun." ◗

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MARC BERLOW

DUKE ENERGY'S "e-team," which includes (from left) Dave Davies, Ted Schultz, Elizabeth Henry, Anne Narang, A.R. Mullinax and Dennis Wood, worked to sell the Internet to its units.

Fiduciary

DEFINITION

A **fiduciary** is a person or group that holds a position involving the confidence or trust of customers, usually related to investments. A fiduciary responsibility can also be seen in broader terms, applying to all services provided to customers by everyone in a company, including IT workers.

BY MATT HAMBLEN

BANKS, BROKERAGES and insurance companies are commonly said to have a "fiduciary duty," but that doesn't apply solely to the way they handle customers' investments. It also means they're responsible for earning a customer's confidence and trust in more general ways, and that involves satisfying customer expectations throughout all levels of an organization, including the IT department.

"Fiduciary is used commonly in the investment management setting, referring to somebody who's a trustee with responsibility for a will or an estate," explains Josh Lerner, professor of business administration at Harvard University in Cambridge, Mass.

For example, when a pension fund holds money, it's holding it as a fiduciary for the individual retiree, he says.

In general, fiduciary refers to a set of responsibilities a company has and not those of a single person, such as a chief fiduciary officer, according to analysts.

"The whole organization has such a responsibility, and it's not the kind of thing you can break down into a part of an organization," Lerner adds.

A company's fiduciary responsibility is borne by its top managers, who must ensure that brokers, advisers, financial managers and others "keep a customer's financial goals and well-being in mind," says Larry Tabb, an analyst at TowerGroup in Needham, Mass.

Those duties include making sure customers' assets are invested in accordance with legal guidelines and ensuring that an account is opened properly.

These activities are often entrusted to automated systems, which are governed by IT shops.

Because fiduciary responsibility can be viewed in broad terms, it extends beyond customer-facing employees and includes IT managers and personnel.

"To the extent that IT builds technology that doesn't serve the client or doesn't work properly or account for things appropriately, it can damage the trust and fiduciary role between a company and client," Tabb says.

Beyond the realm of financial institutions, IT managers act as fiduciaries for their companies' customers and investors as they try to reduce costs and increase revenues, says Avivah Litan, an analyst at Gartner Inc. in Stamford, Conn.

"With the Internet bubble bursting, IT managers at companies are turning from a focus on outward-bound projects, where there might be no [financial] return and [are] instead asking questions such as, 'Can you really use these new network technologies to cut costs?' " Litan says.

The GE Way

Fiduciary responsibility can also apply to how effectively a company applies IT, Litan explains. For example, she has been tracking how General Electric Co. has leveraged electronic bill payments to generate $2 billion in annual cost savings.

GE has enticed 15,000 of its suppliers to use its electronic invoicing and payment system, thus helping GE to avoid the costly process of managing paper checks. The suppliers are paid within 15 days, instead of several weeks, from the time they submit their invoices, which translates into a 1.5% discount for GE on each invoice. That has resulted in a 12% savings on annual invoice payments, or $2 billion, Litan says.

"GE is a good example of how companies need to focus on productivity gains and ROI," Litan adds. "If I was an IT manager, my fiduciary responsibility to my company would be to tell staff, 'If you want to buy technology, it better improve the bottom line.' "

Still, many companies don't seem to have kept their fiduciary responsibilities in mind when they set up their customer relationship management (CRM) software systems, according to Litan. "A lot of companies are just dissecting customers' tastes and preferences with CRM, but after the companies get that information, it turns out the customers just don't want to buy any more from you," she says.

Many dot-coms fizzled because they failed to focus on their fiduciary duties, Litan says. But there are a lot of dotcoms that have focused on their fiduciary roles that will thrive, she says, just as a few large automobile manufacturers survived among the plethora that emerged when cars were first invented.

Litan concludes that a fiduciary in an IT operation is "somebody who spends money on IT projects that save money rather than promising nebulous returns." ▶

"[An IT manager's fiduciary duty is] to tell staff, 'If you want to buy technology, it better improve the bottom line.'"

AVIVAH LITAN, ANALYST,
GARTNER INC.

Examples of a Fiduciary at Work:

- A stockbroker holds a fiduciary duty to his clients to make sure orders are processed properly and that terms of trades are clear and within legal limits.
- A business manager at an insurance company exercises fiduciary duties that stretch beyond processing bills and receipts to helping set policies that protect his investors and those insured.
- An IT manager is a fiduciary in the broadest sense, even when setting up software and hardware systems to run efficiently and consistently. These actions not only protect customers, they also guard the financial well-being of employees and investors.

Sources of More Information:

- www.pfg-group.com/
- www.ibbotson.com/research/
- majlaw.com/select.html
- www.independentfiduciary.com/
- www.ffiec.gov/y2k/826y2k.htm
- www.year2000.com/archive/law party.html
- *Three Steps to Fiduciary Responsibility*, by John Carver (Jossey-Bass, 1996, 22 pages)

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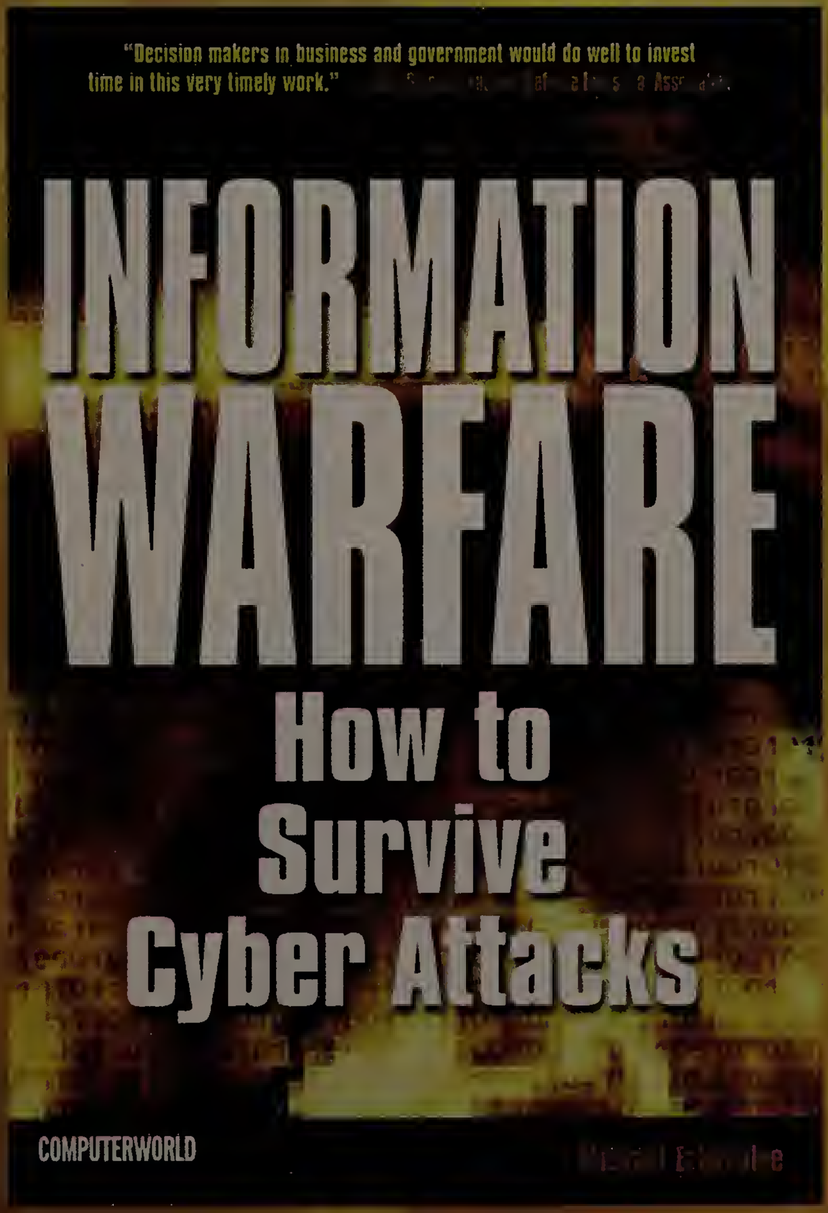

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JOE AUER/DRIVING THE DEAL

Avoid Surprises in Subleasing Deals

A SHARP CONTRACT NEGOTIATOR TOLD ME recently how much fun he has looking over leasing companies' proposed master agreements. He says they're so one-sided that he tries to see how many ridiculous provisions he can find in a single agreement. His record so far: 87.

An agreement he ran across recently was no better or worse than most. It contained a common little "gotcha" in the area of lessor administrative fees. It should remind us how a provision that appears reasonable can still have a bite to it.

Let's look at a way this can happen. If you're a firm with good credit, most lessors will grant you the right to sublease the equipment they leased to you — if you negotiate for it. If your lessor doesn't, you should talk to him about subleasing because it can eliminate or significantly reduce the cost of leasing equipment that you no longer need.

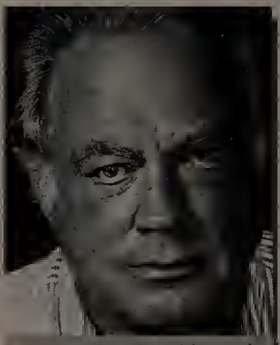
The lessor usually grants the subleasing right, subject to some conditions. These often include the following:

- You agree to remain ultimately liable until all lease obligations are fulfilled; that is, you remain the primary obligor.
- The sublessee must be creditworthy. (Of course, you should insist on this for your protection anyway.)
- The sublessee must agree to the terms and conditions of the original lease.
- The lessor has the right to approve the sublessee.

Insist on having the right to sublease without the lessor's approval.

Granting the lessor veto power essentially surrenders your right to sublease. Besides, if you remain on the hook as the primary obligor regardless of who the sublessee is, the lessor won't be hurt. So why the need for the lessor to approve sublessees? Good question, and one you should ask if your lessor digs in over this point.

Lurking deep within many lessors' right-to-sublease provisions is the annoying and downright sneaky administrative-fee gotcha. Here's a typical phrasing: "Lessee has the right to sublease the equipment, provided that all additional costs resulting from the sublease, including lessor-imposed administrative fees, shall be promptly paid by lessee." Now, what do you suppose this will cost if you exercise your right to sublease? No way to tell, is there? It's virtually a blank check. Would this "administrative fee" be a lessor's out-of-pocket expenses? Its administrative overhead? Something else? Normally, this "administrative fee" is either a percentage of the lease value or a flat amount. In the case our contract negotiator colleague recently encountered, it was a one-time payment of $2,000. This administrative fee is nothing more than an additional revenue source.



JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

Lessors will argue that they have certain back-office costs in setting up a new lessee. In reality, the only transaction required is completion of a sublease agreement. Most lessors don't do much on the sublease because you're still ultimately responsible and the deal continues to be based on your creditworthiness — not the sublessee's.

So what's the advice? Be especially aware of percentage-based sublease administrative fees, since they can result in unpleasant surprises. For instance, just 1% of a million-dollar deal is $10,000 — that's a lot of money for processing some paperwork. If you can't negotiate the fee away, make sure that it's a known, relatively small, fixed amount.

Sublease deals are often done because you need additional horsepower and are leasing bigger and better equipment from the same lessor, and subleasing the original equipment will allow you to fulfill the terms of the lease agreement. In this case, the best negotiation tactic is to leverage the lessor's new revenue from the lease against the administrative fee. The new incremental revenue volume of the newer lease goes a long way toward convincing the lessor to eliminate the administrative fee for subleasing the equipment that's being replaced. But the best approach by far is to eliminate the possibility of a sublease fee altogether when negotiating the master agreement in the first place. ◗

BRIEFS

Live Online Seminars Offer ROI Tips

A series of free, live online seminars for business and technology executives is scheduled to kick off today at 2 p.m. Eastern time.

The monthly seminars, Community Practices and Execution, will explore tips on how companies can increase their return on investment.

They are being sponsored by New York-based Blue Barn Interactive and can be found on the Web at *www.bluebarn.com.*

Today's seminar topic is Reporting and Data Mining: Finding the Value in Your Community. Future topics include Corporate Communities: Changing the Way Businesses Communicate; and E-Tailing Communities: Generating and Managing Profitable Business Relationships Online.

Georgia Inks $30M Claims Services Pact

El Segundo, Calif.-based Computer Sciences Corp. will provide a new information system and claims payment service to the Georgia Department of Community Health. The $30 million, five-year contract is aimed at helping the department develop a single system to process and store health claims data for the state's four government-run health care programs - the State Health Benefit Plan, the Medicaid program, the Board of Regents Health Plan and PeachCare for Kids - which cover almost 2 million residents.

Pfizer Using Travel And Expense App

Eighty-five thousand of Pfizer Inc.'s employees worldwide are using an electronic travel and expense application from Concur Technologies Inc., an online service provider in Redmond, Wash. Officials at the New York-based pharmaceutical maker said the company expects to "achieve significant savings" by using the product worldwide.

HR-XML Consortium Forms Workgroup

The HR-XML Consortium Inc., an independent organization in Raleigh, N.C., that intends to create worldwide XML standards for the human resources profession, has formed a new workgroup to standardize time and expense data reporting.

E-Business Leader Named ViaFone CEO

Russ McMeekin has been named CEO of ViaFone Inc., a mobile enterprise application software vendor in Brisbane, Calif.

McMeekin joins ViaFone from Morristown, N.J.-based Honeywell International Inc., where he was president of e-business. McMeekin succeeds Bernard Desarnauts, who will continue to serve as chairman of the board.

FedEx Puts Critical Shipment Docs Online

FedEx Custom Critical Inc. has enhanced its Web site (*www.fedexcustomcritical.com*) with a new tool that will let customers view and print copies of a shipment's bill of lading, proof of delivery and invoice. FedEx Custom Critical is a critical-shipment division of Memphis-based FedEx Corp.

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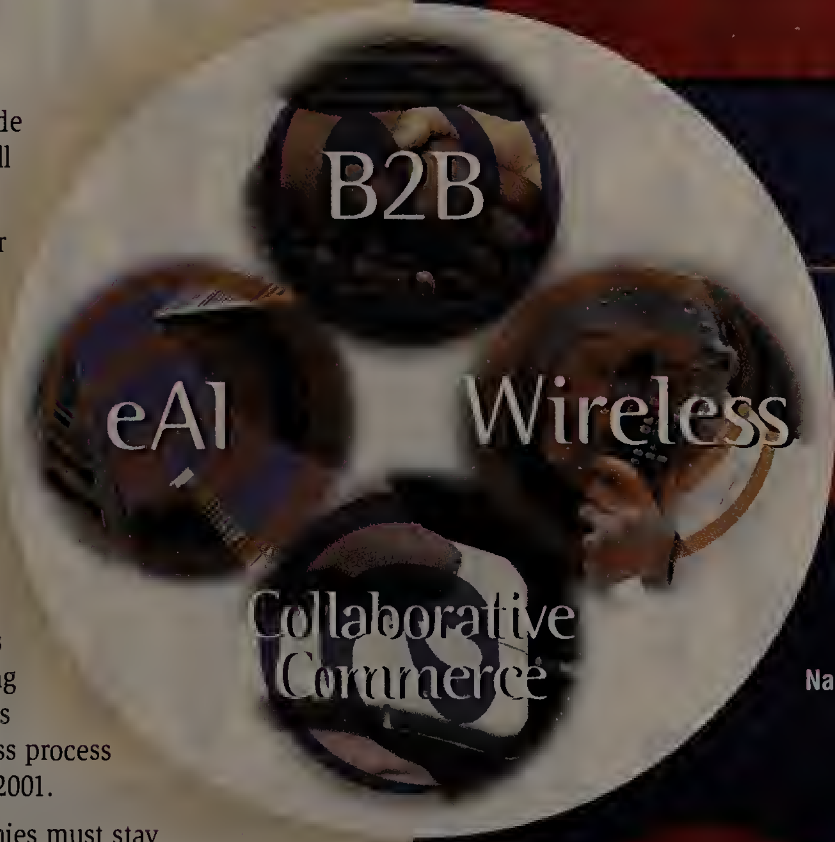
Last year's approaches no longer apply. Companies must stay current as the e-business integration agenda is reshaped on a continuing basis. Applying yesterday's strategies can topple well-intended e-business integration plans. Staying current means engaging in an ongoing dialog with industry peers and experts – the individuals on the cutting edge of e-business integration.

Plan to attend the eBusiness Integration Conference in order to integrate business partners, processes, the enterprise, suppliers, applications and mobile devices.



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TECHNOLOGY

THIS WEEK

MARC BERLOW

REMOTE RELIABILITY
Handling unplanned outages, managing network connectivity, replicating applications and supporting end users are among the challenges of managing IT at remote locations. IT gurus like Jayco's Dave Nijak (above) share their tips for making remote office support a success. **PAGE 56**

IT AND SOCIETY
The CEO of the Association for Computing Machinery discusses where technology is headed and how his organization tries to guide its direction to benefit society. **PAGE 58**

FUTURE WATCH: As the laws of physics threaten to trump Moore's Law, scientists are fighting back. One weapon is strained silicon, which could increase semiconductor speed by 35%, developers say. **PAGE 60**

SECURITY JOURNAL: Security manager Mathias Thurman attends the famous Def Con hackers' conference in Las Vegas and learns both how to attack his systems and how to protect them. **PAGE 62**

EMERGING COMPANIES: Parabon Computation's Frontier software lets IT leverage unused CPU cycles on desktop PCs for heavy-duty number-crunching. **PAGE 64**

RUSSELL KAY

Encryption Pipe Dream

IN A COLUMN EARLIER THIS SUMMER, Frank Hayes discussed the importance of encrypting e-mail [Frankly Speaking, June 4]. He concluded that we're not doing it routinely because we don't believe — erroneously, in his view — that we need it.

I think Frank is wrong. The problem isn't that we don't care; it's that encryption is entirely too difficult to accomplish. Sure, all the technology is at hand. Anyone with a technical bent or a compelling need can install, say, PGP and encrypt his messages.

I could do that, but I haven't because I don't know a single person I correspond with who could then read my messages. At the current state of communications software, encryption is suited for dedicated e-mail among a few, well-defined partners. It can be useful for internal communications at a given organization where an IT staff can enforce and manage keys, but otherwise, forget about it.

Encryption simply can't work as a tool until it's nearly omnipresent and totally invisible to the user. Not until encryption is built into all common e-mail software. Not until everyone we want to decrypt our messages is able to do so. Not until all those people have public/private key pairs or personal certificates. And not until there's a simple mechanism to discover and use someone else's public key or certificate.

The Decryption Hassle

I receive between 150 and 200 e-mail messages every workday. An increasing number of those daily messages are already encrypted, after a fashion, and they're a nuisance to deal with.

Computerworld's e-mail runs on Lotus Notes 4.6. If you send me an e-mail message whose body is in HTML, it normally arrives as an attachment labeled "attl.htm." I can't read that message directly. Instead, it takes two to three more mouse clicks to send the attachment to a "decryption program" (a Web browser).

Worse, some messages arrive as plain HTML text, with so much code and tagging that I have to go through even more bother and steps to turn them into files I can then read in a browser window. Given the extra time and effort needed to read such messages, I look carefully at the sender and the subject line before I even think about reading them — and, in fact, I delete most of them unread.

These days, we can count on everyone having a browser. But if even HTML e-mail is a major nuisance in many cases, what chance does encryption have?

Suppose I want to send you confidential information in encrypted form. Must I first send you the proper encryption/decryption software and then ask you to install it, generate keys and let me know your public key? I'd better not be in a hurry!

Encryption will work only when the exchange of keys or certificates becomes a good deal more automatic and simpler than the capture of e-mail addresses, as you'll realize once you see a PGP public key. You won't memorize that string of characters. Not for anyone. The public-key infrastructure (PKI) initiative is supposed to take care of all these key management and directory issues, and maybe it will. Someday.

For sending encrypted e-mail, an electronic address book won't be just an option; I won't be able to function without it. But what happens if I'm using someone else's computer at, say, another office or an Internet café. How do I send e-mail encrypted with my key? How does someone reply to me in confidence? Do I end up storing my address books online by necessity, and will that do the job? Will I need to carry smart cards with that data, or a special handheld device?

When, If Ever?

None of these problems is insurmountable; in fact, we already have all the technology we need. Until e-mail encryption is both effortless and available everywhere, it will remain a curiosity, a necessary but awkward tool reserved for special occasions, determined individuals, defined pairs of correspondents and co-conspirators.

We, as users, can't make change happen by ourselves. We need all the primary vendors of e-mail software — including Microsoft, Netscape, Lotus and Qualcomm — to include encryption as a standard feature. We need PKI to work as quickly, universally and transparently as the Internet's Domain Name System.

Those vendors need to know that it's not just IT people who think it's important to encrypt e-mail, it's everyone who uses e-mail. Most of my personal e-mail isn't confidential, but for some messages, I do want and need the privacy that encryption can provide.

I think that once most e-mail users realize how exposed their plain-text e-mail is, they will want the capability to encrypt some messages. But encrypted e-mail has to be simple enough for your grandmother to use before it's ready for business. As of now, it flunks that test. ◗

RUSSELL KAY is *Computerworld*'s senior reviews editor. Contact him at **russell_kay@computerworld.com.**

IT Support for Remote Offices

Troubleshooting IT gets complicated when the problem is miles – or maybe even an ocean – away, in a remote facility or branch office. Here's how several users cope.

By Lee Copeland

IT WASN'T A TYPICAL WEEK. BUT THEN again, nothing about managing IT services for a remote office ever runs like clockwork.

Two of Jayco Inc.'s T1 network lines — the ones that provide Internet and telephone connections to recreational vehicle maker's main engineering facility and its Lagrange, Ind., manufacturing plant — went dead one week in June. Network monitoring software picked up the failures right away, but so did the end users.

"The monitoring system will alert us to a problem within a minute," says Dave Nijak, director of information systems at Jayco. "But in that minute, you will get a cell phone call from a user — guaranteed."

So began an atypical workweek at Jayco, with the launching of two separate, but equally frantic, fact-finding missions to uncover why the engineering group and the Lagrange plant couldn't access networked applications like the e-mail, phone and computer-aided design (CAD) systems.

For the past 32 years, the private, family-run company has been designing and manufacturing camping trailers and recreational vehicles (RV). Over the years, Jayco has expanded beyond its main corporate headquarters in Middlebury, Ind., into four sprawling corporate campuses that include 35 buildings and nine manufacturing plants in the U.S.

20 Miles to Go

Jayco's main engineering facility for motorized vehicles, which is located about eight miles north of Middlebury, and its Lagrange plant, which is just 20 miles east of the headquarters, typically operate with few headaches, but not that week in June.

The engineering office lost its IT systems first. After a series of remote diagnostic tests turned up empty, Nijak asked technicians to visit the site to manually examine the network system. "You get into the blame game [with your telecommunications provider]," says Nijak. "We sent technicians out and checked our network equipment from the point we were receiving a signal, and it wasn't our problem."

> You get into the blame game [with your telecommunications provider]. We sent technicians out and checked our network equipment, and it wasn't our problem.
>
> DAVE NIJAK (BELOW), DIRECTOR OF INFORMATION SYSTEMS, JAYCO

MARC BERLOW

Nijak says the telecommunications provider reluctantly sent a technician out to evaluate its network lines. "And lo and behold, they had a problem with their box," he quips. Five hours later, the problem was fixed.

T1 service to the manufacturing plant was restored overnight. That disruption also turned out to be caused by a problem with the telecommunications provider's network. In that case, a network line had mistakenly been cut.

Dealing with unplanned outages, managing network connectivity, replicating applications and supporting end users' machines are among the challenges of managing IT at branch offices, satellite facilities and other remote locations.

Steve Kennedy, president of 4-U Computing LLC, a systems integrator in Fort Wayne, Ind., says determining the type of connectivity required to provide bandwidth to disparate locations is the first concern that IT staff should address when helping with the opening of a satellite office.

"In a point-to-point environment, you know exactly where the data is going, and security isn't a problem because there is no other traffic on the line other than yours," says Kennedy. "But it's typically an expensive option if it has to go a long distance."

Jayco, for example, uses point-to-point connections to its nearby satellite offices and is in the process of installing a second T1 line to beef up bandwidth to its rapidly growing engineering group.

Jayco is also evaluating a microwave LAN system, which provides full bandwidth from land-based LAN systems via line-of-sight radio antennas to satellite offices within range. Jayco anticipates that its engineering group will double in size, from about 50 employees today to more than 100 during the next year, making two TI lines insufficient. The microwave LAN could address the growing bandwidth demands at the RV maker's satellite offices, since those sites are within a 30-mile radius of the main campus and therefore could receive a bandwidth boost from the more robust LAN at corporate headquarters.

Jayco's information systems department is also in the process of installing a separate, on-site CAD server for the engineering office, with the aim of off-loading approximately 50% to 60% of bandwidth demand. "The demand over the network will get limited to e-mail and casual file transfers," Nijak says. "People doing CAD work who are constantly moving large files throughout the day will do it locally."

Securing the Connection

But installing TI lines and microwave networks at remote offices is an expensive option.

To reduce costs, a number of companies use Internet tunneling to give users in satellite offices access to corporate systems. Internet tunneling, the process that creates a virtual private network (VPN), allows data to be encapsulated into packets for transmission via the Internet. But VPNs also have limitations; most work best for lower-bandwidth traffic.

At Baltimore-based Crown Central Petroleum Corp., remote users who need to access the corporate SAP enterprise resource planning system go in through a VPN, as opposed to accessing data from a replicated server at a satellite office. "We don't do mass replication [at remote sites] because bandwidth would be an issue," says John LeMay, network manager at Crown Central Petroleum. "It's like putting a basketball through a garden hose."

Because replicating servers can pose problems, a number of companies allow smaller remote offices to simply dial into the network or use a VPN rather than setting up on-site e-mail and other shared applications.

Maintaining servers and desktops is always a challenge in remote offices, and that challenge can be compounded by budgetary constraints. But systems administrators report that a growing number of remote server monitoring and management tools from vendors such as IBM, Microsoft Corp., Net Integration Technologies Inc. in Markham, Ontario, and Network Associates Inc. in Santa Clara, Calif., are making their tasks easier.

"Managing a box without someone physically down there can be a problem," says Greg Gentilini, senior systems programmer at St. Paul Cos.

The St. Paul, Minn.-based insurer operates 150 branch offices throughout the U.S. Gentilini uses Compaq Computer Corp.'s Lights-Out tool to remotely boot servers up and power down spent servers when the operating system gets locked up. Lights-Out also allows Gentilini to address common server problems while he's off-site.

Still, branch and remote offices consist of more than just back-end servers and network cables. Managing desktop PCs and laptops also takes effort.

"In a small, remote office, the biggest factor is expense," Kennedy says. "Most remote offices often don't have the budgets required to provide a wide range of services or to pay for on-site MIS to manage those needs."

Instead of hiring a full-time IT support technician for every remote location, many companies have IT staffers from headquarters make weekly, monthly or quarterly visits to remote offices, where they deal with any PC problems, connectivity complaints or networking issues that have cropped up since their last visit.

One company that uses that model is eSkye Solutions Inc., start-up that runs an exchange service for liquor distributors.

Based in Indianapolis, the 2-year-old company operates satellite offices in Madrid and London and uses outsourced IT support at its London office. Every Tuesday, an IT consultant visits the office and provides support services, says Keith McLoud, CIO at eSkye.

"It gets a bit more challenging when you cross the Atlantic," McLoud says. But he keeps remote management simple by keeping the infrastructure of the remote offices simple. "The only shared software is e-mail," he says.

Enforcing uniformity on PCs, laptops, desktop configurations and applications is the most common tip from the field for keeping the management of remote offices simple.

"It's the key to our success and keeping support cost low," says LeMay. If all users — particularly those in remote offices who receive IT support services only on a weekly, monthly or quarterly basis — are limited to the types of productivity suites and applications on their desktops, support becomes much easier to administer, LeMay explains. ▶

Connecting IT And Society

In 1947, the Association for Computing Machinery (ACM) was founded at the University of Pennsylvania by the people who invented ENIAC, the world's first electronic digital computer. As a result, the ACM has "this very funny-sounding name and people think it's a trade association," says John White, CEO of the New York-based organization. He notes that the name reflects the fact that when the ACM came into existence, computing was brand-new and all about hardware — the concept of software was a few years away.

White became CEO in 1999, after years of serving in volunteer positions in the ACM while carrying on his career as a professor of computer science at the University of Connecticut and as a research manager at Xerox Corp.'s Palo Alto Research Center.

In a recent interview with Computerworld *technology editor* **Tommy Peterson,** *White discussed the mission of the ACM and the future of computing.*

WHO IS HE?

John White is CEO of the Association for Computing Machinery, the oldest computing society in existence. The ACM's mission, says White, is to promote education, the exchange of ideas and the development of IT in ways that benefit society.

What is the mission of the ACM? Our mission is fairly broad — the key part is to advance the state of the art in information technology and computing. And that mission is not just to serve the needs of the profession, whether it's a researcher or practitioner, but to also really serve the needs of the public. ACM has done the best job serving the research community, or the advanced development community, but we have, over the years, reached out to fulfill our broader mission.

We're beginning to take on some pretty serious issues, issues like education in general, like diversity and gender equity in our field.

I think we all agree that information technology is transforming our lives today and will continue to transform life in the future. ACM, having established a world-class program to disseminate information, is realizing it has a huge responsibility to play a lead role in ensuring that information technology contributes to the future in the best way possible.

Because of that, we start worrying about education, both in the high schools and for the general public. For the public, we hope to help them understand what the future's going to look like, how IT is going to shape it, how IT is becoming increasingly pervasive and invisible and what that might mean.

ACM has for nine years dabbled in public policy issues, trying to educate the people who make public policy and trying to get them to understand the technologies that they're trying to legislate around. We've just opened a Washington office. We're not lobbying. We try to shape policy by offering a deeper understanding of relevant information technology issues.

What is the ACM's relationship with the commercial world? We view industry as an incredibly important partner in doing what needs to be done in information technology. We try to engage them as partners in taking on some of the bigger responsibilities: What are we going to do about information technology and how it's impacting people? What are we going to do about the state of education? What should ACM be doing with industry to make IT a more established profession? What should we do about risks to the public with systems [in terms of privacy]?

What do you see as the future of the Web? The Web is definitely not going away. The implosion of the dot-coms and the shakeout in that industry is largely the result of normal economic forces.

The Web is continuing to change and shape how we work and what we do. What we're doing today on the Web is going to become more pervasive, and on the other hand, it's going to become more invisible. We're going to be working with information more and more, it's just not going to be so obviously sitting in front of the computer connecting to your [Internet service provider], connecting to various Web sites. It's a future of services being ubiquitous.

The future of the Web and computing is more of the right information that you want, when you want it and where you want it, with less hardware in the way.

What's the hottest topic in IT? Probably the future of wireless technology. Can we really make wireless work in a way in which we can find value? On the communications side, that's still the No. 1 project. On the systems and software side, I think it's still very much, Are we going to have open systems that a lot of people can access to and understand how they work? On the policy side, we'll be focusing on information technology and the right to privacy balanced with a concern about scientific freedom and the free and open interchange of information.

Are we going to resolve the dilemma of making people choose between privacy and convenience? Technology will help us with this. It will provide ways in the future to secure information that will become increasingly ubiquitous in transactions on the Net, for example.

Government still has a role to play, in that understanding an individual's right to privacy is a first step and then ensuring that it's not invaded is a second step. In Europe, there's much more attention paid to data protection acts than there is in the States. In the States, it's left up to everyone to be a good citizen.

Is there a way for us to survive and use the flood of data in both our work and our personal lives? Technology is going to help us there in the sense that it will be increasingly easy to express what you're interested in and get everything out there working for you. Personalization is one of the great opportunities of the future.

When the technology becomes more pervasive and invisible — when you can get what you want and it's less intrusive — I don't know if we will have solved information overload, but it will go a long way toward freeing us. ◗

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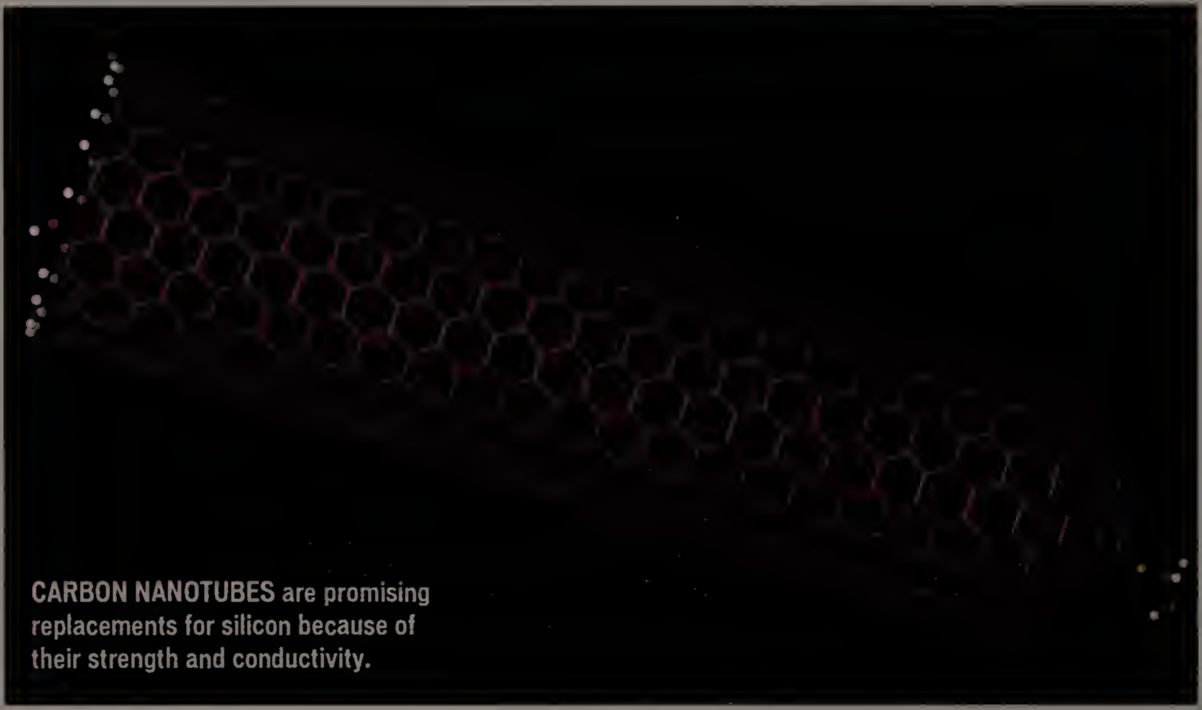
Transistor Triumphs

As the laws of physics threaten to trump Moore's Law, scientists are fighting back. By Steve Ulfelder



CARBON NANOTUBES are promising replacements for silicon because of their strength and conductivity.

RICE UNIVERSITY

ONLY A FOOL would predict the imminent demise of Moore's Law.

Thirty-six years ago, Intel Corp. co-founder Gordon Moore observed that the density of transistors on chips doubled every 18 to 24 months, doubling the amount of processing power per dollar. For the past decade, it's been fashionable to assert that Moore's Law is in peril and that microprocessors are straining physics — but you can buy a desktop PC with a 1.3-GHz chip for $900.

At a June conference in Kyoto, Japan, IBM announced that it had altered the structure of silicon in a way that could increase semiconductor speed by 35%.

Strained silicon, as it's called, has been in development for more than a decade and hinges on the tendency of atoms inside compounds to align with one another. For example, IBM placed silicon atop a substrate of silicon and germanium, whose atoms are farther apart than pure silicon's. In response, the atoms in the silicon "strained" about 1% farther apart, according to H.S. Philip Wong, a senior manager at IBM Research.

The effect was like enlarging the holes in a sieve: Electrons raced through strained silicon 70% faster, for a 35% improvement in real performance.

The real breakthrough is that IBM can manufacture the advanced chips using conventional processes, Wong says. The technology will be used in high-end servers and routers as early as 2003.

Shortly after the Kyoto conference, IBM announced that it had pushed the silicon-germanium technology to speeds of 210 GHz in tests while drawing 50% less power than current designs. IBM says that will lead to the production of communications chips running at 100 GHz within two years.

IBM wasn't the only company with major news in Kyoto. Intel showed that it has shrunk switches further than many — including Moore — believed possible, unveiling silicon transistors 20 nanometers wide compared with widths of 250 nanometers, which are common today. A human hair is about 60,000 nanometers wide.

The transistors could be used to build chips that run at 1,500 GHz and draw 1,000 times less power than Pentium 4 chips. Energy efficiency is a bonus property of smaller, faster transistors and will extend the battery life of mobile devices and reduce heat buildup.

Intel says the transistors can be built using today's processes and will be in Intel chips in 2007. Jerry Marcyk, director of Intel's Components Research Laboratory, says, "The goal of the project was to shrink [conventional components] to see where they stop working. They haven't stopped working yet."

Impressive advances notwithstanding, silicon will one day run out of steam. You can only cram so many switches on a chip before electrical leakage, heat buildup and manufacturability present insurmountable obstacles. The need for increasingly precise tooling will drive the cost of a semiconductor fabrication facility to $200 billion by 2015. That kind of price tag prompts companies to build better mousetraps. IBM, Intel and others have postponed the day CMOS technology becomes obsolete, but that day will come.

One promising successor is the carbon nanotube, which draws its name from its material (pure carbon), its size (1 to 3 nanometers in diameter) and its shape (a tube composed of hexagonal structures). Nanotubes are light yet strong, conduct heat well and are better electrical conductors than copper.

Nanotubes have astonishing potential, but making them work together is difficult. "We can make an array of [nanoscale] structures," says Paras Prasad, director of the University at Buffalo's Institute for Lasers, Photonics and Biophotonics in New York. "The challenge is making the electronic and photonic connections."

Some scientists foresee production nanotube chips 16 times faster than today's as early as 2004. But others disagree. "Organizing [nanotubes] to form a circuit is nowhere near application," says Dmitri Antoniadas, director of the Microelectronics Advanced Research Center at MIT. "For that, we're probably looking beyond 2015."

In 1999, researchers at Yale University and Rice University created both switches and memory elements by altering organic molecules so they would trap electrons at given voltages. They've shown promise as reusable switches that can, given the right conditions, self-assemble into a desired configuration, essentially manufacturing themselves — at a fraction of the cost of building conventional transistors.

Such chips could be 1,000 times faster than current technology, and memory speed and density could be increased by an order of magnitude. "The combination of small size and the use of self-assembly has the potential to cause a discontinuity in the economics of microcircuitry," says Mark Reed, an engineering and applied science professor at Yale. "The ultimate for shrinking the size of a switch is the molecular level."

Researchers have said that hybrid silicon-and-molecular computers will hit the market within 10 years, but as with carbon nanotubes, connectivity and manufacturability questions may make that forecast optimistic.

These areas of research are some of the leading efforts to first extend and then replace silicon. But one thing's for sure: You shouldn't write off Moore's Law just yet. ◗

Ulfelder is a freelance writer in Southboro, Mass. Contact him at sulfelder@charter.net.

Future Watch 50 Years Ago

"Even at the present very early stage of transistor development it seems certain the transistor will replace vacuum tubes in almost every application. What results can we expect from this major revolution . . .? Since [it] is just beginning, we can only speculate."

– Scientific American,
August 1951

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IT'S A DIFFERENT KIND *OF* WORLD.
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Security Manager's Visit to Def Con Is an Eye-Opener

Mathias gets a glimpse into a growing and technically formidable hacker community at Las Vegas confab

BY MATHIAS THURMAN

IF YOU'RE IN ANY WAY involved in information security, you owe it to yourself to make a trip to Def Con. The ninth annual conference was held in Las Vegas during the insanely hot month of July. Originally advertised as "the largest underground Internet security gathering on the planet," it has through the years transformed itself into a much more commercial event. However, the conference still retains its underground, hacker look and feel.

SECURITY MANAGER'S JOURNAL

I came to see and better understand the kind of people who may very well try to hack into my firm's systems. The experience is one I'd strongly recommend every security manager have at least once.

The conference was divided into several areas. In one area, desks and tables were set up in what looked like a call center. Here, one could find hard-core hackers (many with tattoos, piercings, purple hair or Goth wardrobes) who had set up their computers and connected into the private Def Con network to participate in an online "capture the flag" contest. Participants attempted to hack into one another's systems while protecting their own machines from being hacked.

In another area, vendors were selling T-shirts, computer hardware, software, books and telephony equipment. And in yet another dark, smoke-filled area, a DJ or an occasional live band played techno and other music. Still other areas of the hotel were dedicated to lectures ranging from more general newbie hacker topics to hard-core "überhaxor" technical discussions.

Meanwhile, TV crews ran around trying to get someone to agree to an interview. But most attendees didn't want to be interviewed for fear that if they said the wrong thing, they'd get hacked. It's happened before.

Def Con is full of antics and traditions. One example is the scavenger hunt. The organizers pass around a list of items, and whoever collects the most items wins. This year, they listed a pay phone as one of the items. Believe it or not, someone actually unbolted a public pay phone from its hinges, but he got caught and was arrested.

Another favorite event is called "spot the fed." The game — which goes on throughout the conference — involves identifying a person who looks like a federal agent or government official, like a CIA or National Security Agency employee, and identifying that person in a public forum, such as in one of the lectures. If the identified person is indeed a fed, then the spotter and the official receive T-shirts emblazoned with "I spotted a fed" and "I am the fed," respectively.

For security managers, Def Con is a valuable event for many reasons. First, it gives you the chance to meet the enemy. Many of the people attending Def Con don't maliciously hack into other peoples' systems. But some do, and this is a good place to learn about them.

The first Def Con in 1993 attracted about 150 people. This year, there were well over 4,000. I guarantee that some of those individuals were criminals who had gained unauthorized access to computer systems for some sort of gain. If the increases in attendance are any indicator, the shear number of such criminals has increased dramatically.

The technical sessions are another attraction. Def Con's lectures are designed for hackers, and many discuss how to attack and compromise a system. But this year, more lecturers focused not just on exploiting vulnerabilities, but on how to close them as well.

For example, in a lecture on securing Cisco routers, the speaker presented ways to block different denial-of-service attacks, then went into detail as to how to further protect your network by using simple access-control lists. There is a simple command, "no IP-directed broadcast," that you can use to prevent smurf attacks. To prevent TCP SYN flood attacks, the speaker suggested using the TCP intercept capabilities of the router.

Another discussion demonstrated the use of the Internet Control Message Protocol (ICMP) to identify the operating system that a target computer is running. In the past, many tools used TCP to accomplish this task, so systems administrators protected their systems against the use of TCP. The key, however, is to ensure that you allow only the proper ICMP packets into the network. For example, if you're using ICMP with the ping utility to ensure system availability, then you should only allow ICMP packets related to ping. Most firewalls allow for this configuration.

There were also a few forums related to how to trace an attack back to its source. Although the discussions and methodologies were interesting, the bottom line is that there is still no surefire way to trace hackers without full cooperation from the upstream Internet service providers.

Another interesting discussion was a legal topic related to the Digital Millennium Copyright Act, passed by Congress in 1998, which governs the implications of the modification of code. One provision makes it illegal to "manufacture, sell or distribute code-cracking devices used to illegally copy software." In fact, it was under this provision that Russian programmer Dmitry Sklyarov was arrested at the conference this year for developing software that lets users break the copyright protection in Adobe Systems Inc.'s eBook Reader. It's interesting that this controversial law apparently excludes law enforcement, intelligence and other government organizations from its provisions.

Perhaps the most interesting part of the conference for me was observing the attendees. Many of them were capable of performing kernel rewrites on the fly and other programming feats with such speed that they put most seasoned IT professionals to shame.

THISWEEK'SGLOSSARY

Internet Control Message Protocol (ICMP): An extension to IP that includes controls, error data and messaging information. Hackers may use ICMP to gain information about a host machine. For example, different operating systems respond in distinctive ways to specifically crafted ICMP packets. By examining the characteristics of return packets, a hacker may be able to determine the operating system used to generate them.

LINKS:

***www4.law.cornell.edu/uscode/17/1201.html*:** The 1998 Digital Millennium Copyright Act is worth a read, particularly if your job involves protecting intellectual property. Many sites offer opinions and explanations of the law, but you can read the actual text and decide for yourself at this Cornell University Web page.

***www.blackhat.com*:** The Black Hat Briefings security conferences and training sessions are offered in Europe, Asia and the U.S. Check out Black Hat Inc.'s Web site for presentations from the most recent conference.

***www.h2k.net* and *www.summercon.org*:** The Hackers On Planet Earth and SummerCon conferences are primarily for serious hackers, but they're also a good source of technical information.

There was some serious talent at the conference — talent that I would have liked to hire. But then, no one would give me their real names. I also realize that with all that talent out there, I could face some formidable adversaries. I'll have a lot of work to do to keep up.

Note: Problems with my HushMail account have left me unable to receive reader e-mails. If you have comments or didn't receive a response from me recently, please contact me at my new address: *mathias_thurman@yahoo.com.* ◗

Quick Link For more on the Security Manager's Journal, including past journals, visit: **www.computerworld.com/q?q2000**

■ This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com or go to the Security Manager's Journal forum.

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Putting a Harness on Desktop Horsepower

Parabon's peer-to-peer distributed network technology is a supercomputer alternative

BY LEE COPELAND

According to proverbial wisdom, idle hands are the devil's workshop. But start-up Parabon Computation Inc. says that harnessing the processing power of idle computers can provide a welcome boost to the work that goes on inside the enterprise.

Fairfax, Va.-based Parabon taps into the unused processing power of idle computers with Frontier, a distributed application that's available as a service over the Web or as server software. To process large computational projects, Frontier breaks the request down into smaller jobs and then distributes them to many computers running simultaneously on the network.

"It comes down to economics," says Steven Armentrout, founder, president and CEO of Parabon. "Instead of buying a supercomputer for $1 million or more and trying to keep the machine fed and busy and to justify the costs to [their chief financial officers], we give customers the option of only buying the time that they actually use."

That was an attractive proposition to Celltech Group PLC. The Slough, England-based drug maker needs to run complex human-gene-sequencing algorithms, computations that take about two weeks to process on the company's older mainframe, says Neil Ward, a bioinformation specialist at Celltech. But purchasing a supercomputer to cut down on processing time wasn't a financial option.

This spring, Celltech began parsing out the sequencing work over the Web to idle computers in Parabon's network. That has cut the processing time for each sequence to four hours. In the long term, Celltech would prefer to bring its processing work in-house, but that would require many more PCs than the 500 it has now, says Ward.

Customers such as Celltech use the Frontier Internet service to connect to Parabon's network of 75,000 individual PCs around the world. Enterprise customers, however, can install Parabon's Frontier Enterprise server software inside their firewalls, tapping into the idle computing resources of internal machines. About 80% of Parabon's customers use the server software to process jobs internally, while the remaining 20% use the Internet service, says Armentrout.

"It's a twist on standard distributed computing," says John Coons, an analyst at Gartner Inc. in Stamford, Conn. "Crunching raw scientific data is an excellent application of distributed processing. There are a lot of MIPS and storage out there that are going unused."

The South African National Bioinformatics Institute has been evaluating Parabon's service to locate new malaria genes for drug-testing research, says Win Hide, director of the Bellville, South Africa-based nonprofit organization.

Hide considered outsourcing the project at a cost of $12,000 to $15,000 per year. But processing the gene sequence searches using Parabon's Frontier Internet service will cost less than $6,000 per year, he estimates.

Hide says he's pleased so far with the performance testing work that's part of the evaluation process, but he acknowledges that he was somewhat reluctant to rely on technology from a start-up company.

Coons says security is a concern when processing takes place using random end-user PCs over the Web. Parabon encrypts each job that it sends to individual PCs, which mitigates security concerns, Armentrout claims. Frontier also uses a Java virtual machine for processing, which adds another layer of security.

Celltech's gene sequencing project didn't involve proprietary data, so security wasn't an issue, Ward says. But if his project did use competitive research, Celltech wouldn't transmit that data over the Internet. Allaying such security concerns may be key to Parabon's goal of broadening its customer base to attract companies in other compute-intensive businesses such as animation and financial services. ◗

"WE GIVE CUSTOMERS THE OPTION of only buying the [computing] time that they actually use," says CEO Steven Armentrout.

COMPUTERWORLD emerging companies

Parabon Computation Inc.

3930 Walnut St.,
Suite 100
Fairfax, Va. 22030
(703) 460-4100

Web: *www.parabon.com*

Niche: Distributed computer processing technology leverages existing PCs for compute-intensive tasks. Can use either internal corporate PCs or Parabon's PC peer-to-peer network.

Company officers:
- Steven Armentrout, president and CEO
- James Gannon, chief technology officer

Milestones:
- June 1999: Company founded
- July 2000: Performed philanthropic cancer analysis for the National Cancer Institute
- November 2000: Launched Frontier

Employees: 50

Burn money: $7 million from angel investors; a new round of funding is under way

Products/pricing: Frontier Internet service starts at $8 per hour; Frontier Enterprise server software starts at $75,000

Customers: Celltech Group, Celera Genomics Group and the South African National Bioinformatics Institute

Red flags for IT:
- Parabon's service relies on a network of approximately 75,000 volunteer PCs from individual users around the world, which may create security risks for sensitive data.
- Frontier hasn't yet gained wide acceptance for applications outside of biotechnology.

[the buzz]
STATE OF
THE MARKET

Creating a PC Army

With more than 300 million PCs available worldwide, finding participant machines for networks such as Parabon's should be easy. But Mark Eggleston, an analyst at Currid & Co. in Houston, says sustaining a large network of "volunteer" machines is a problem.

"Consumers are not quite ready to donate computing cycles for purely commercial projects," he says. To attract participants, Parabon sponsors giveaways – $100 per day and $1,000 per month – and philanthropic projects.

Steven Armentrout, Parabon's founder and CEO, says the company hopes to strike deals with Internet service providers in the near future to get access to more computing resources. Parabon also offers a software development kit that allows customers to build custom, Java-based applications for its distributed network of PCs.

Frank Bernhard, an analyst at Omni Consulting Group LLP in Davis, Calif., says the development kit is a significant differentiator for Parabon. In his view, it's a benefit to customers because it allows developers to build powerful new applications that don't contain the same resource constraints as those designed to run on a single or clustered server.

Parabon's competitors include the following companies:

Gene Logic Inc.

Gaithersburg, Md.
www.genelogic.com

Gene Logic creates custom gene-expression databases for pharmaceutical and biotechnology companies that want to discover new drug targets. Gene Logic focuses exclusively on genomic information and bioinformatics processing related to drug discovery research.

United Devices Inc.

Austin, Texas
www.ud.com

United Devices' MetaProcessor server enables organizations to aggregate idle computational, storage and bandwidth resources from within a corporate network. It also offers MetaProcessor as a service that allows users to tap into idle corporate computing resources from remote computers over the Web.

–Lee Copeland

IBM

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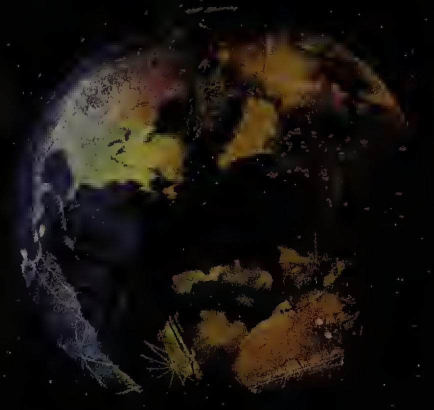

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IT Careers in Security

Anyone working with information technology knows that the issue of IT security continues to escalate. The exposure, risk and awareness are mounting as companies invest to maintain firewalls and assure that as new applications and networks come online, their integrity is protected.

@stake, based in Cambridge, MA, is among the firms helping companies assess and address their IT security risks. According to IDC, Internet security services spending is projected to reach $17.2 billion worldwide by 2004. James Mobley, executive president for the Americas, says @stake works primarily with financial services firms and large IT service providers to evaluate their networks and applications for possible security risk and on authorization systems that ensure users are who they say they are. **@stake** is also working with several insurance clients to help them assess the risk of a catastrophic break in a company's network. The insurance companies will use the information to help in writing premiums.

"**@stake** works on interesting projects, and we're fortunate to play with clients who have complex business models," says Mobley. "We also help clients plan for what happens when they are attacked – their incident response readiness – and train and educate their employees about IT security."

To meet client needs, **@stake** is looking for people who have experience with security systems and who have deep technical expertise. "We also look for people who have a consulting profile," says Mobley.

Employees are supported through ongoing learning known at **@stake** as "learn and burn". Employees come together to do problem solving on a key business topic. "Culturally it helps everyone stay up to date on what is going on with the firm and to learn from one another. We pride ourselves on learning from the experts who are here," says Christina Lucani, chief people officer.

@stake has opportunities in New York, San Francisco and London. "You'll experience a blend of projects in your backyard as well as elsewhere," says Lucani. "Just as important, you will deal with the technological issues of today while also examining what the top technology security issues will be four to five years down the road. Thought leadership and research and development are hot with **@stake**."

For more job opportunities with security firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Jonis Crowley, 650.312.0607 or jonis_crowley@itcareers.net.
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IT Careers in Healthcare

Healthcare agencies and institutions continuously upgrade information technology to improve patient care and business operations. Frequently they turn to outside firms to develop the new applications and products to support their very human needs.

That's where **Siemens Medical Solutions Health Services Corporation** comes in. Based in Malvern, PA, **Siemens Health Services** is the worldwide headquarters for **Siemens**' healthcare information technology business and is the largest application service provider in healthcare. With more than 30 years in business, it currently hosts better than 1,000 healthcare organizations remotely out of its information services center. And, while many ASPs are struggling to hold a place in today's market, **Siemens** continues to grow and expand.

The IT organization is supporting two categories of work. On the customer side, **Siemens** IT pros develop leading-edge clinical, financial and administrative applications for more than 2,000 U.S. healthcare provider organizations. Internally, the IT group is renovating **Siemens**' architecture and introducing application portfolios for sales force automation and professional services.

Dave Rice, CIO, says the customer projects are organic development, requiring people who have skills in business systems analysis, programming and development, test and delivery. "We like to hire people who have experience in the healthcare industry," says Rice. "We also look at the continuity of your work experience and the diversity of your academic training – for instance, a technical degree paired with a master's in business."

On the internal side, Rice is hiring people to support integration, tailoring and implementation of PeopleSoft's professional services portfolio and SIEBEL's sales force automation suite.

In addition to the technical skills required, Rice also considers whether prior experience has created a value to the business and what you've been able to accomplish under pressure. "I also look for information about the individual – whether you're active in your community and that kind of thing," adds Rice. That's important to the **Siemens** culture where the sense of community is a strength. "Healthcare and healthcare IT attract a certain type of person, someone who is rewarded by having a positive impact on human beings and who can see the greater good of our work."

Employees transfer easily between the customer and internal infrastructure support roles, and **Siemens** also has ISC, telecommunications and outsourcing business operations as career paths for IT professionals. As a division of **Siemens**, the company operates in 193 countries, offering employees a range of opportunities for global experience. "With **Siemens**, you have an opportunity to get varied experiences under the same tent," says Rice. "We believe in investing in people so that you can become part of a proud tradition."

For more job opportunities with healthcare firms, turn to the pages of ITcareers.

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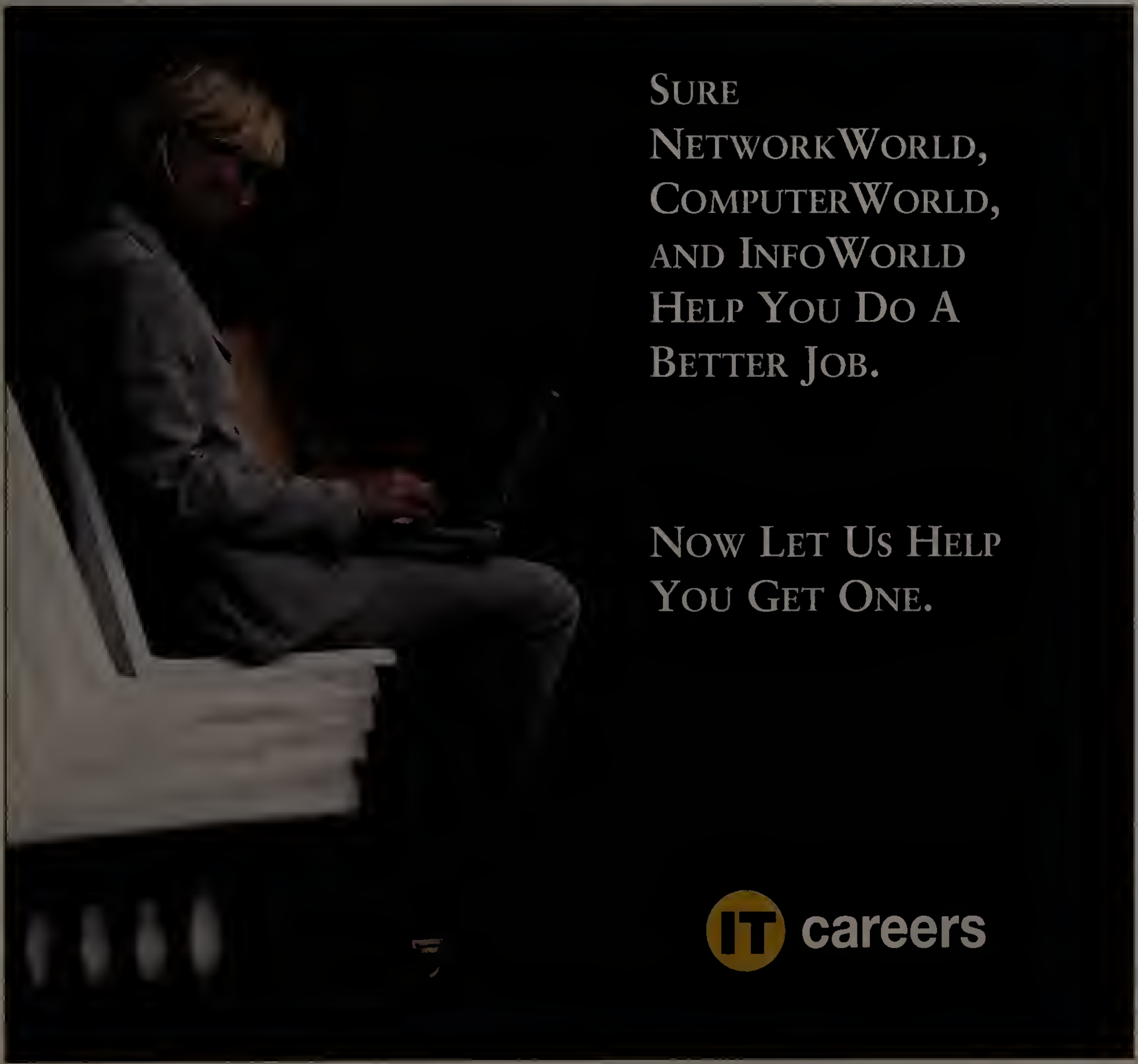
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Network World - Manager of Database Technology -Southboro, Ma Job Requirements: Masters degree in electrical/electronics engineering or CS, or alternatively a Bachelor's degree in the same and 5 years of progressive IT experience as a database architect or team leader working on disk space management and data retrieval. Must have knowledge of an Oracle 8 environment and developer/designer 2000. Resumes should be sent to hotjobs@nww.com.

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All positions require BS/MS degree with a minimum of 2 to 3 years of experience in the field. Must possess excellent communication skills as well. NET2S offers a competitive salary, with an excellent benefits package including medical, dental and 401(k). Relocation assistance may be provided For immediate consideration, please send your resume to: NET2S, 82 Wall Street Suite 400, New York, NY 10005; Fax: (212) 279- 1960; Phone (212) 279-6565; or Email: jobus-ny@net2s.com

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The MathWorks leads the market in developing and delivering high performance interactive software products such as MATLAB® to the engineering and scientific communities. We're increasing our lead by hiring the best people for every job in the organization. We have the following positions available at our offices in Natick, MA.

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Design, develop and test the MATLAB family of products. Programming experience in MATLAB, and/or C, C++, Java is required.

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Develop and enhance state-of-the-art algorithms used to simulate and analyze advanced communications systems. Prior experience simulating communication systems using MATLAB. Strong theoretical knowledge of advanced communication systems and algorithms.

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Develop test suites and conduct hands-on testing of the MathWorks applications products. Programming experience in MATLAB and/or C, C++, Java.

Software Engineer Real-Time Application Specialist

Develop next generation embedded real-time code generation product. Experience using Perl, M, C and TLC programming languages is required.

Senior Real-Time Software Development Engineer

Develop MATLAB and C code for new simulation and code generation applications of Simulink and interface automatically generated code running in real-time on The MathWorks' PC Target product. Experience with Real-time systems and C programming is required.

The aforementioned positions are available at all levels and require a minimum of a B.S. or M.S. in Computer Science, Engineering, Math or a related degree and 0-5 years experience with MATLAB, Simulink, RTW, Controls, or DSP Environments.

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- Pricing & Licensing Specialists
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- Compiler Engineers
- Embedded Engineers
- Training Engineers
- Technical Writers
- DSP Simulink Developers
- Process Control Engineers
- Program Managers
- Technical Marketing Managers

For fastest consideration interested candidates should e-mail their resume, indicating position of interest to: resumes@mathworks.com. Attn: Human Resources – Job Code: IW7/01
The MathWorks, Inc., 3 Apple Hill Drive
Natick, MA 01760-2098
Fax: (800) 434-8967

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Software Engineer (multiple openings): Design, develop, implement and maintain computer software systems in Windows NT operating environment; convert project specifications into database design, using Oracle and Sybase database; develop application software using Power Builder and database administration sills. Req: Master or foreign equiv degree in CS, Computer Applications or related plus 4 yrs of work exp in job offered or 4 yrs in related occupation as Software Engineer or related. Send resume to Axiom Systems, Inc. 20300 Century Blvd., 1st Floor, Germantown, MD 20874. Ref. AJ

Database Administrator
Perform physical/logical data modeling for complex financial apps, design, develop and test physical/logical databases, tune, initialize parameters, trouble shoot, develop stored procedures and database triggers and perform other DBA duties. Requires travel/stay at client sites. BS with 2 yrs. exp. in job offered & Oracle DBA (8/8i) certification. $57,000/Yr. Contact Director, Webcougar, Inc., 295 Henley Place, Duluth, GA 30097. EOE.

Multiple openings for perm. Network Analyst in Atlanta, GA to work with terminal emulation solutions/legacy extension user interfaces in PICK, HP and IBM Mainframe/OS400 operating environments using VB, HTML, SFTIII fault tolerance server and Microsoft technologies. B.S. in Comp. Sci., Math or related field (or foreign equiv.) + 2 yrs exp. as S'ware Eng, Tech Support Con. or related. Send resume to Pixel USA, Inc., Attn: Eva Savage, 5275 Triangle Pkwy, Suite 150, Norcross, GA 30092 or fax to 770/449-6388.

Software Engineers needed for Miami based software consultancy firm to design, develop and implement computer based decision support systems. Min req. 4 yrs. exp. Send resumes only to Financial Technologies, Inc., 11098 Biscayne Blvd., #403, Miami, FL 32807.

Telecommunication, Systems Engineer in Fort Lee, NJ. Must have Bach in Comp Sci or Elec./Electronic Eng. Send resume to Attn: Mr. Jaemin Bark, SK Telink America, Inc., 400 Kelby Street, 9th Floor, Fort Lee, NJ 07024.

Hardware Design Engineers needed by silicon virtual components & design services provider in Red Bank, NJ to study telecom standards & customer reqts, write design specs, implement designs in VHDL, run simulations, synthesize design & provide technical support. M.S. in Electrical Engg, Telecommunications or related. Send resume to Amine Kandalaft, Ref. 1515, ModelWare, Inc., 10 West Bergen Place, Ste 105, Red Bank, NJ 07701-1500.

SAP HUMAN RESOURCES APPLICATIONS CONSULTANT, 8am-5pm, Research, develop and design computer software systems as they relate to HR management functions such as payroll, benefits and time management. Required: proficiency with SAP HR and SAP ABAP/4, ASAP Cert., B.S. in IT or related field, or equiv. Send Resume: ted.bromberg@cedar.com An Equal Opportunity Employer

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- SYSTEMS ANALYSTS
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Sr. Programmer. Job location: Frederick, MD. Duties: Research, define & analyze dept. requirements including high level & detail system design & database definition. Prepare logic flowcharts. provide applicable production standards & procedures to meet user performance requirements. Write prg. specifications. Design prgs using PickBasic in a Pick Operating System. Maintain & update existing code. Examine & investigate database irregularities. Perform code testing using real or test data. Resolve system soft. problems. Prepare required documentation of file, screen, report using the system documentation soft. Provide instruction, training & support to end users. Requires: B.S. or equiv in Comp. Sci./Info.Sci. or related field. Will accept any combination of educ. & exp. equiv. to a B.S. degree plus 2 yrs exp. in the job offered or 2 yrs exp. as a Consultant. Exp. which may have been obtained concurrently, must include: 2 yrs exp. using PickBasic in a Pick Operating System. Send resume to Carol A. Dantzic, Mid-Atlantic Medical Services,. Inc., 800 Oak Street, Frederick, MD 21703.

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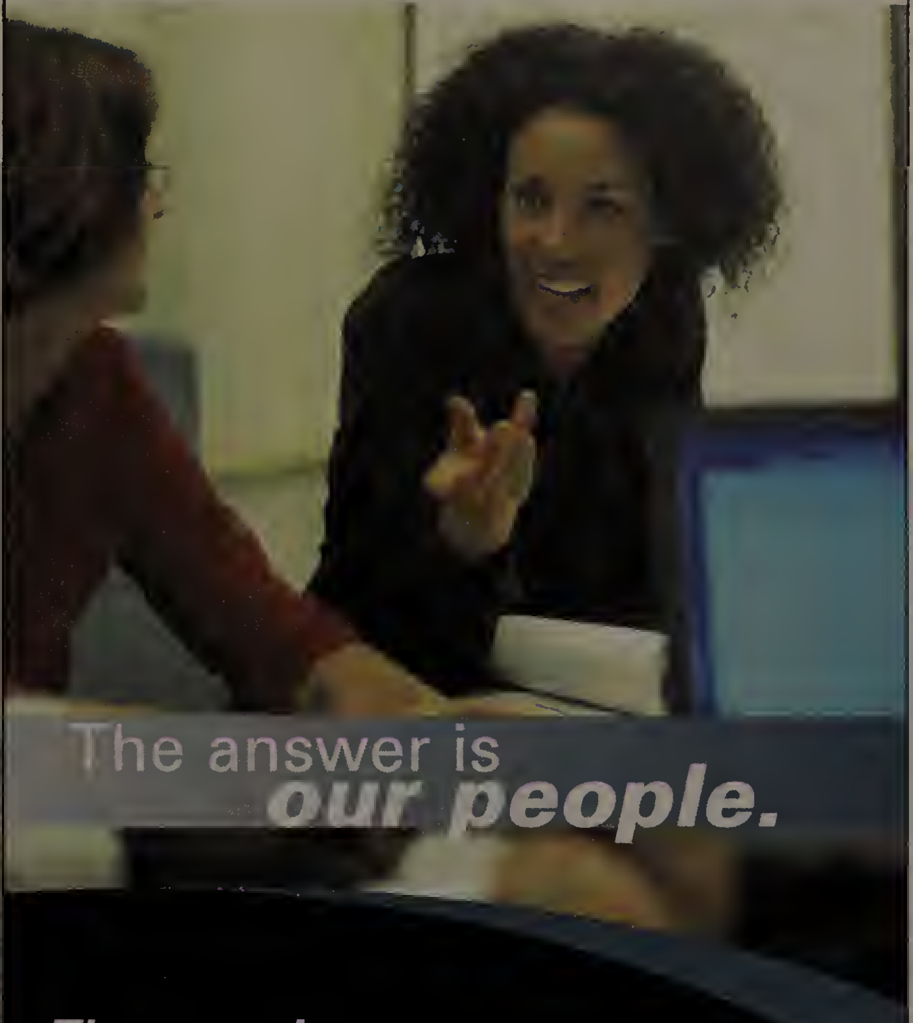

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F/T Development Manager. Provide leadership & direction to a team of developers, Oversee employee performance planning evaluations, salary admin. & organization of training & hiring. Implement procedures for application development & architecture specification. Work w/ Architects, Software Engineers, Designers, Project Leads & Product Mgrs. to set direction for MAPICS applications & technical architecture. Evaluate designs in new & existing modules/ applications & assist in the design process for major modules/functionality. Must have Bachelor's degree in Computer Science, any Engineering discipline or related field. Foreign degree equivalent accepted. Must have 2 yrs. exp. in job offered or position w/ same duties. Salary: $88,400. Send resume to Phyllis Scott, MAPICS, Inc., 1000 Windward Concourse Pkwy., Ste. 100, Alpharetta, GA 30005.

Computer Services Mgr. wanted to be involved with mgmt., budgetary planning, direction & day-to-day maintenance of computer & network equipment for Physics Computer Resource Facility; provide systems admin. & user support for Unix & PC computer systems in highly networked Windows environment; advise & train users in oper. of hardware & software; super. systems & programming staff; recommend, purchase, install, customize & monitor hardware & operating system components to ensure security & performance; provide support of network server-client systems for WWW, Email, FTP, NIS, DNS, NFS, & other system level processes. Must have Master's deg. in Physics or Comp. Sci., 5 yrs. systems admin. exper., incl. Unix & Windows operating systems & server-client arch. & programming. 40/hr/wk. Salary $74,000/yr. Send 2 resumes to Case#20011931, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Zeeo, Interactive, Inc., an Internet consulting and development company, is looking for a candidate to fill the position of Senior Web Developer. If you are interested, please send your resume to Matthew Greer, President, Zeeo Interactive, Inc., 93 Summer St., 4th Fl., Boston, MA 021t0. No phone calls please.

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing and implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server & Java environment and maintain server modules written in C & C++. Provide technical support to client, evaluate business requirements & develop software according to established standards using Centura w/ embedded SQL, PL/SOL, Gupta, SOL, Unix, Oracle, VB, VB Scripts & CMVC. Must have Bachelor's degree in Computer Science, Engineering or related field. Foreign degree equivalent accepted. Must have 2 yrs. exp. in job offered or position w/same duties. Salary: $62,940. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, FL 33126

F/T Projects Consultant. Resp. for providing technical support for database administration & for initiation of new code path policies working w/ C, HP, UNIX & SOL, PL/SQL. Assist in developing databases for translation purposes & creating new applications to initiate new product releases to customers & database tables using, TCP/IP. Develop testing strategies, plans, conditions & analyze codes to determine database population & defects in customer's telecommunications billing software. Install & assist w/ upgrades for in-house translation tools & issues. Must have Bachelor's degree or the equivalent in Computer Information Systems or related field. Foreign degree equivalent accepted. Must have 2 yrs. of exp. in job offered or position w/ same duties. Salary: $60,000-65,000. Send resume to Jennifer Smith, Sema, 6 Concourse Pkwy., Ste. 2700, Atlanta, GA 30328.

SOFTWARE ENGINEERS (10 positions): require Bachelor's in Engineering/Computer Science/ Mathematics/Science or closely related major with two years experience providing skills in described duties, at $70,000 per year; Senior Software Engineers (8 positions) with Master's and two years experience, at $75,000 per year. Provide on-site consulting in design, analysis, analysis and development of software application in Oracle, DB2, SQL Server and Sybase; e-commerce and web applications development in Microsoft, Java and related technologies; network management systems development with Netscape Server and related tools; SAP R/3 applications on Windows with DOS and ABAP/4 and related modules. 40% travel to client sites in the United States. Mail resumes to: YASH Technologies, Inc., 2100 Parklake Drive, NE, Suite F, Atlanta, GA 30345-2167.

Computer Professionals: **INFOERA SYSTEMS, INC.,** Piscataway, NJ. To study, plan, analyze, design, develop, test and Implement computer programs and systems. Expertise/skills in IBM Mainframe, DB2, RDBMS, SQL, AS/400, RPG-IV, CICS, VSAM, IDMS DB/DC & CL. Qualified candidates must have a Bachelor's or Master's degree in Computer Science or equivalent. Min. 4 for BS/1 for MS years of progressive work experience. Excel. salary and benefits. Travel and/or relocation required. Fax your resume to **732-926-8376** or Email to infoeras@yahoo.com by referring to code **IESI01PR02_2**.

F/T Server Mgr. Design, test & maintain Web server architectures for co. website inc, server environment IIS, ASP, C++ & operating system software patch levels across website. Resp. for site backups & work w/NOCs & co-loc. prov. Member of support team for site issues, 24x7 website & HHNT high transactions, web & SOL db servers. Develop & support GIS systems using Mapinfo. Work w/ UNIX, NT Server, IIS 4 & 5, TCP, HP/ManageX & networking in CISCO & 3COM. Must have Asso. deg. or equiv. in CS, and Engin. discipline or related field. Foreign deg. equiv. accepted. Five yrs. exp. Salary: $65-72,000. Resume to James Dale, Headhunter.Net, Inc., 333 Research Court, Suite 200, Norcross, GA 30092.

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Design for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server & Java environment & maintain server modules written in C & C++. Provide technical support to clients, evaluate business using Visual C++, Rational Rose, UML, TCL/TK, Unix, Oracle, SOL, & CMVC. Must have Bachelor's degree in Computer Science or related field. Foreign degree equivalent accepted. Educational background must have included the above referenced skills. Salary: $60,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

Technical Specialist: Kennesaw, GA. Install company's software at customer sites. Analyze and troubleshoot and implement processes of products. Prepare technical training programs and train customers. Perform on-site support, install and support internal test systems. Req.: 4 yrs. exp. in stated job or in hardware development and concurrent experience that includes 4 yrs. exp. working in the computerized printing industry, 4 yrs. exp. with electronic hardware, and 2 yrs. exp. using UNIX. Shane O'Toole, CCI Europe 1701 Barrett Lake Blvd., Suite 380, Kennesaw, GA 30144

Software Engineers w/exp in one or more of the following: VB, ASP, Com/ActiveX, SOL Server, Oracle, Perl, & Vignette application suite. Apply to: Ebusinesscorp Inc. 2 Arnold Terrace, Burlington, MA 01803.

Several FT positions open for exp'ed Project Mangers, Prog/ Sys Analysts, S/W Engineers and DBAs skilled in some of the following: Java, HTML, COM, IIS, ASP; Oracle, Developer 2000, PL/SQL, Power Builder; VB, SQL, Sybase; Windows NT/UNIX admin, web/wireless technologies; datawarehouseing; database admin etc. Require a BS/MS with conc. in CS/Engg (any branch)/Math, Business or related field. Highly competitive salary. Traveling involved to client sites. Send resume to: Cosyne Enterprises, Inc. 3235 Satellite Blvd., Bldg. 400, Suite 300, Duluth, GA 30096.

F/T Sr. Technical Analyst. Resp. for the development of Business Support Control System (BSCS) for the wireless telecommunication industry, work w/ BSCS 3.03 & 5.21. Assist clients in evaluating business needs & develop testing strategies, plans & enhancements for existing software. Provide management guidance during conversions or application upgrades, resolve data conversion issues & oversee modules setup configuration & data migration. Must have Bachelor's degree in Computer Science or related field. Foreign degree equivalent accepted. Must have 2 yrs. experience in job offered or position w/ same duties. Salary: $68-80,000. Send resume to Jennifer Smith, Sema, 6 Concourse Pkwy., Ste 2700, Atlanta, GA 30328.

Vice President, Business Strategy (Atlanta, GA): Assist in the development of the company's corporate strategy. Perform strategic & economic analysis for the senior management team & Board of Director; manage the company's key strategic alliances & assist the CEO & senior management team in communicating the company's business strategy to employees, partners, current investors & prospective investors. Req. Bachelor's degree in Electrical or computer engineering or its foreign degree equivalent plus minimum of 4 yr exp. managing corporate/business strategy programs in data & telecommunications industry. Resume to: Joan Tolliver, VP of HR, Cbeyond Communications, 320 Interstate North Pkwy, S.E., Ste 300, Atlanta, GA 30339.

Software. Bus S/ware Eng to participate in full lifecycle syst development, using object oriented & iterative development processes using CGI, Javascript, C/C++, Java, Unix, Web Servers. MS in Comp. Sci/Eng/related & 6 mo exp a must. Res to: Cyber Dialogue, HR Dept, 304 Hudson St, Fl 4, NY, NY 10013.

Software Engineer w/exp in one or more of the following s/w: UML, ERWin, OOAD, Rational Rose, Jprobe, C, C++, Visual C++, Java, HTML, JavaScript, XML, ASP, Oracle, Sybase, Pro*C, PL/SQL, MS SQL Server, VB, PB, TCP/IP. Apply to: KSAP Technologies, Inc., 5290 Spalding Bridge Ct., Norcross, GA 30092. Email info@ksaptech.com

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Engineering Specialist. Kennesaw, GA. Consit & advise with cust's project team to determine softw. & syst. specifications, usage & setup. analyze & handl. tech. issues & design, dvlp & plan training rel. to usage of the comp. syst & prgms. Resp. for defining & planning all startup activities for the customer. Technical proj. team. Req.: MS Computer Science & 2 yrs exp. technical analysis & softw. Design solutions, working knowledge gained through academic coursew. or exp of C programming & UNIX. Resume: Shane O'Toole, CCI Europe 1701 Barrett Lake Blvd., Suite 380, Kennesaw, GA 30144.

IP Network Engineer (Atlanta, GA): Design, configure, manage, troubleshoot & streamline the company's IP network. Design, manage & troubleshoot the BGP & OSPF network routing policies. Provide technical guidance, direction & training to other network engineers & 2nd level support to the NOC. Establish dept. policies & implement required procedures for IP network. Work w/the planning dept. to create & maintain a network plan. Review, approve & manage the IP vendors & work w/other Telecom Carriers & Internet Service Providers. Req. B.Sc. in Computer Engineering or its foreign degree equivalent plus 2 yr. exp. in job offered. Resume to: Joan Tolliver, VP of HR, Cbeyond Communications, 320 Interstate North Pkwy, S.E., Suite 300, Atlanta, GA 30339.

Web Developer (Melrose Park, PA) Designs software & internet applications; creates forms using HTML, DHTML, XHTML & Javascript, displays data using XML & XSL from DB2. BS/BA Comp. Info Systems, Business Admin + 1 yr exp. Fax 215-782-2083 Ref HB.

Sr Java Developer(3 positions available). Design & develop s/w based on coding stds; design OO modeling diagrams; use EJB, Corba, Servlets, & other J2EE or J2SE components to implement architecture reqs; review & edit UML documentation; run blackbox, whitebox, & regression testing on s/w modules; & use s/w repository sys to maintain code revisions. Req: B.S., Comp Sci (or equiv education/training) & 5 yrs exp in: 1) development; 2) OO technologies; 3) using Java to implement OO s/w sys or components; & full life cycle development. Exp. may be gained concurrently. Send resume to: Linnea Gambino, Incellico, Inc., 2327 Englert Dr., Ste 205, Durham, NC 27713, or call 919-484-7222ext. 232.

F/T Senior Database Analyst. Design & implement complex oracle data structures as well as 24x7 production support of Oracle data structures. Analyze & resolve complex problems in mission critical Oracle environments & maintain Oracle databases using Oracle Enterprise Manager & BMC Oracle Utilities. Must have Bachelor's degree or foreign degree equivalent in Computer Science or related field. Must have 5 yrs. exp. in job offered or position w/ same duties. Send resume, indicate job code; IDD-CW8/13/01 to sras@ups.com or United Parcel Service, P.O. Box 833, Mahwah, NJ 07430, Attn: Sharon Ras - Human Resources, R2A-026

Sinoma Consulting, Inc., an information systems consulting services company, is looking for candidates to fill the following positions:

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Senior Development/ Database Adminstration Consultant

If you are interested, please send your resume to Alex B. Vilner, President, Sinoma Consulting, Inc., 8-d Overlook Circle, Smithfield, RI 02917.

Sr S/W Engineers to lead teams to analyze, design and develop OLTP systems and data warehouses/data marts; business information modeling, logical & physical data & process modeling using ERwin, Visio, BRIO, Informatica, Oracle, MS SQL Server, & VB; or analyze, design and develop in multi-tier architecture and Internet based Market Exchanges (B2B & B2C), database design, using Oracle, ERwin, Developer/2000, Visual Interdev, Rightworks, ASP, JSP, XML & XSL. Require: MS in CS/Engg (any branch) with 3 yrs exp in the job offered. BS or foreign equiv with conc. in CS/Engg (any branch) plus 5 yrs of progressive exp will also be accepted. 80% traveling required. Highly competitive salaries. Resumes to: HR, Mindspan Systems Inc., 6050 Peachtree Parkway, Suite 240-214, Norcross, GA 30092.

F/T Engineering Account Manager, Negotiate & manage contracts w/ clients & system integrators in the telecommunication industry & provide technical support to clients throughout the software implementation process. Using GISCOM software prepare project work plans, schedules & monitor budgets. Recruit, train and oversee personnel responsible for development enhancements and release upgrades. Must have Bachelor's Degree in Computer Science, any Engineering discipline or related field. Foreign degree equivalent accepted. Must have 5 yrs. exp. In job offered or position w/ same duties. Salary: $85,000. Send resume to Betsy Moya, Sema, 701Waterford Way, Ste. 300, Miami, FL 33126.

F/T Software Engineer. Resp. for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform unit testing on developed codes & troubleshoot defects found. Design & implement new modules in client server & Java environment & maintain server modules written in C. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using UNIX, Pro*C & ORACLE. Must have Bachelor's degree in Computer Science, and Engineering discipline or related. Foreign degree equivalent accepted. Must have 2 yrs. of exp. in job offered or position w/ same duties. Salary: $62,915-64,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

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SAP Consultant
Atlanta, GA

Design, develop, implement, test, support and maintain cost accounting and logistics application software for finance, controlling, sales and distribution, materials management and production planning systems using SAP software tools. Requires a Bachelor's degree (or foreign equivalent) in Computer Science, Business Administration, Business Information Systems or a closely related field with 3 years experience in the offered position or as a Software Consultant or Programmer/ Systems Analyst. Experience must include 1 year implementing systems using SAP. Salary: $75,000 per year. Hours: 8am to 5pm, M-F. Send resume to: ATTN: JOB MK, Corporate HR, Plaut Consulting, Inc., 1050 Winter St., Suite 2300, Waltham, MA 02451. (No Phone Calls Please). EOE.

OPERATIONS MANAGER
Townsend Computer Technologies seeks an Operations Manager to oversee maintenance activities for mainframe and laser printing equipment; and manage team of field service engineers in performing problem diagnosis and repair. Position requires a Bachelor's degree in Electrical, Electronic or Mechanical engineering or equivalent work experience, and prior experience In field service management Candidates must also have expertise in IBM mainframe equipment and peripherals, and production laser equipment.
Send resume to:
Personnel Townsend Computer Technologies
318 Manley Street Unit 3 West
Bridgewater, MA 02379

SOFTWARE ENGINEER to design, develop, implement, test and maintain application software using Visual Basic, COM, ASP, MTS, Sybase and SQL Server under Windows and UNIX operating systems. Require: M.S. degree (or equivalent) in Computer Science/Engineering, Science Technologies, or a closely related field with one year of experience in the job offered or as a Systems Analyst; A B.S. degree with five years of progressively responsible experience will be considered equivalent to an M.S. degree. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Roz L. Alford, Principal, ASAP Staffing, LLC, 3885 Holcomb Bridge Road, Norcross, GA 30092; Attn: Job PR.

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Resume to: Software AG, Inc., ATTN: HR, Computerworld Ad, 11190 Sunrise Valley Dr., Reston, VA 20191. Fax: 703-391-8340. For additional information, find us under Computer, or visit our Web site: www.softwareagusa.com.

System Analyst: Design, develop, integrate, test & implement multiplatform software based solutions & sup. Automated prod. Systems. Interface w/ clients rep., prod. Mngrs or supervisors to define & doc. Business req. Id analysis & def. of req. into functional design specifications. Design, develop & main. prg. In accordance w/ established guidelines & standars. Analyze & resolve prod. Processing problems. Works w/ Windows NT Terminal Server (CITRIX) admin. & configuration, ARC SERVE (for system backups & recovery). Utl. Software develop. for BULK e-mail gen. (SMTP), ATM/POS Claim/Track, Project Mangtn Tool for timing & control, Foreign Trade Zone Inventory & Billing appl. Tandem Systems: TAL, COBOL, Performance & Tunning (MEASURE), FUP, PUP, TACL, ENFORM, Inspect, Non-Stop-SOL. Works w/Performance Utilities, EMSPerus, BIC ISO, XPNET, 40 hrs per wk, 9A-6P. 2 yrs. exp. in job offered. Fax resume to (305) 667-9401.

QA Manager

Houghton Mifflin Company is seeking a Manager, Information Technology Quality Assurance, for our Boston, Massachusetts office, who will be responsible for providing quality assurance for Houghton Mifflin Company IT systems. The incumbent will research, design, and develop a quality assurance process to support Houghton Mifflin Company information and technologies.

Send resumes to: Nicole Sherman, Houghton Mifflin Company, 222 Berkeley Street, Boston, MA 02116; Fax: (617) 351-1106 or email: Nicole_Sherman@hmco.com. NO PHONE CALLS PLEASE. Houghton Mifflin Company has a strong and proud commitment to diversity.

Exec Search, Inc. a technology consulting firm seeks multiple individuals for the following positions in our Brookfield, WI office:

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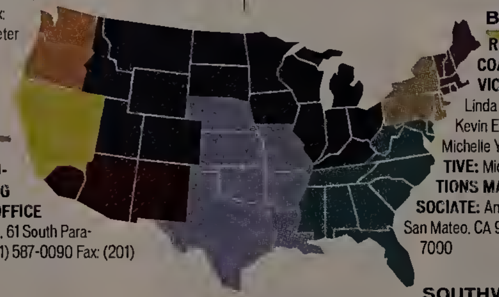

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TVA

it joined late last month.

The backbone of the plan is the reworked supply chain system, and the stakes are high. "We have to find every efficiency in our business in order to stay alive," said Diane Bunch, senior vice president of information services. "We can't [just] try e-commerce. We have to make it work."

According to Gary Ownsby, the TVA's e-commerce procurement project manager, the installation of Atlanta-based Indus International Inc.'s PassPort software has given the authority a common set of supply chain processes. The installation was completed last month, giving every TVA facility a view of product inventories throughout the company.

PassPort also lets the TVA "punch out" information from its back-office system to a business-to-business marketplace using XML protocols and a real-time Web interface, said Ownsby. Once a purchase order is executed in the marketplace, the data is routed back to the TVA system.

When Pantellos Group Ltd., the TVA's chosen public exchange, upgrades its MarketSite software from Pleasanton, Calif.-based Commerce One Inc. next month, Ownsby added, the electricity generator will be able to directly send data between that marketplace and its private one. That could be used for things such as comparing buy and sell prices on the two exchanges, he said.

Ultimately, the TVA plans to receive orders for poles, transformers and wiring from power distributors through its private marketplace and then fulfill the orders using the accrued buying power that The Woodlands, Texas-based Pantellos is expected to provide.

In a project related to the PassPort one, the Unix-based supply chain system has been tied to an Oracle work management system using MQSeries messaging middleware.

"When we get a work order at one of our plants, [the Indus software] will check our inventory companywide to see if we have the right materials," Bunch said. "And if we don't, it will then punch out [a purchase order] to the marketplace."

Thus far, very few companies have managed to figure out a role for both public and private online exchanges, let alone make them work in harmony, said Dean Nelson, a consultant at Deloitte & Touche LLP in Wilton, Conn. The TVA "is definitely one of the first to put that kind of architecture together," Nelson said. And like the TVA officials, he noted that supply chain improvements are key to such projects.

Elcom Inc. in Norwood, Mass., designed the TVA's private marketplace using its Pecos software and is hosting the exchange. The only applications distributors need to use the marketplace are an Excel spreadsheet and a Web browser, Ownsby said.

The TVA didn't customize PassPort or Pecos in any way, he added. "That runs the cost of the software up, as well as the cost of revisions. When we went shopping, we decided it had to work out of the box." ◗

POWER PLAYER

About the TVA

- Established by Congress in 1933 to provide flood control, safe navigation and electric power along the Tennessee River.
- Operates 11 fossil-fuel plants, five nuclear reactors, 29 hydroelectric plants and four combustion turbine plants.
- Provides electricity to 158 local power companies and 62 large industrial customers in an 80,000-square-mile area.

Quick Link For more information on this topic, visit our E-Commerce Knowledge Center:
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An Open-Source Portal on the Front End . . .

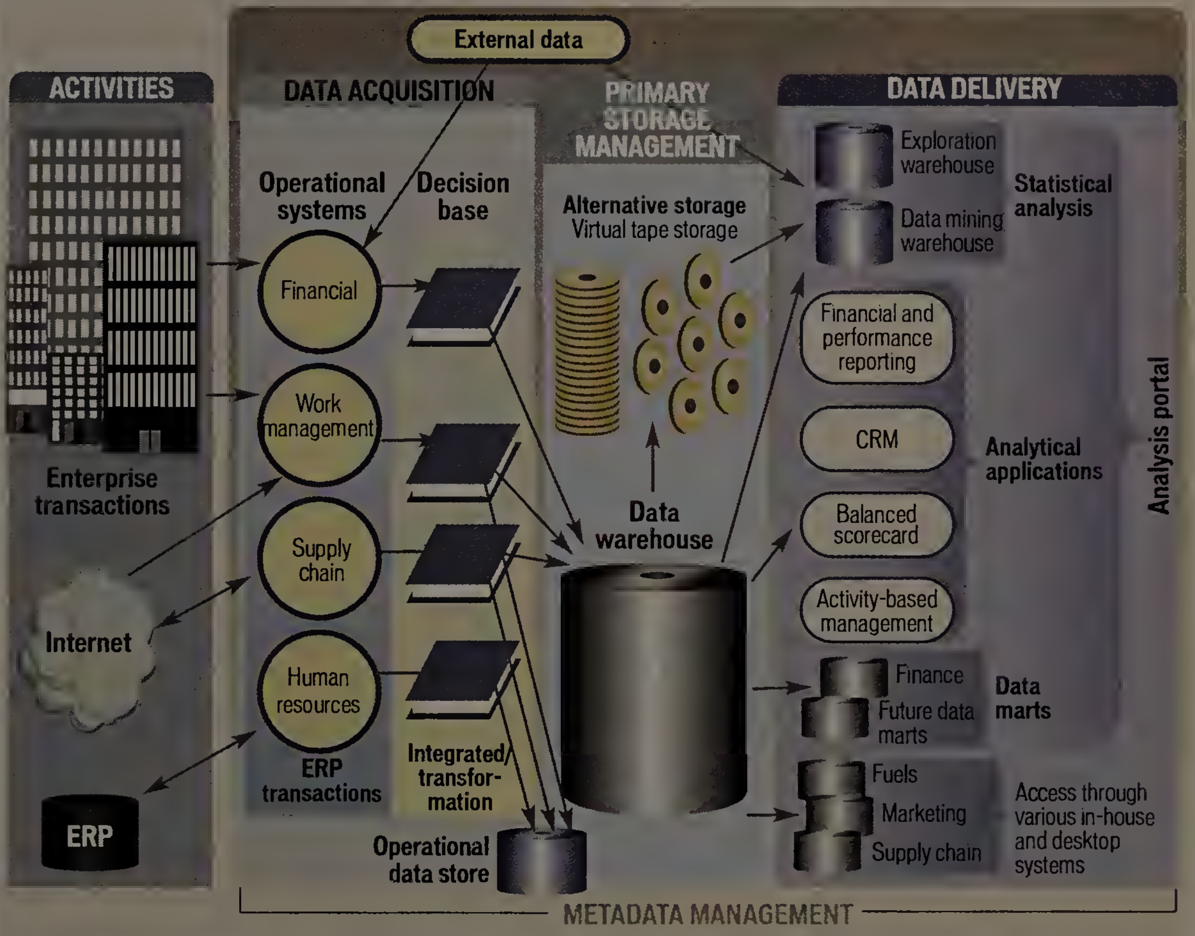
With major IT projects involving new marketplaces, a unified supply chain system and middleware messaging software in its budget, the TVA didn't have a lot of money left to spend on a Web page.

So the company built its own business-to-business portal using open-source technology to keep costs low.

Buying more expensive off-the-shelf portal software was "the one thing we could put off," said Doug Wielfaert, the TVA's manager of Internet services. And as it turns out, he added, you can build a perfectly decent start-up business-to-business portal based on open-source products.

The TVA used an Apache Web server that's linked to its Unix business systems. To create common gateway interfaces, it chose Mason HQ, a Perl-based development and delivery engine that handles functions such as data caching, debugging and templating.

Separate passwords are currently needed for the customer service, online billing and private marketplace features offered on the portal. But Wielfaert said the TVA is looking to bolt on a security product to create a single sign-on and access policy manager.



. . . And a New Data Warehouse on the Back End

The TVA's next step, one that will affect many of its 13,000 employees, is to build a Web-enabled data warehouse for the huge amounts of information created by its systems.

The authority's wide-area network is processing 21TB of data a month, an 82% increase from last summer due largely to increased business use of the Internet. Currently, information gets stored in separate departmental silos.

"Like it or not, our application strategy has been best-of-breed, and it's getting to the point where we need to pull all that different data together," said Diane Bunch, the TVA's senior vice president of information services.

The data warehouse will be built on IBM's DB2 database running on a mainframe, with IBM's Shark disk arrays handling storage. Information will be pulled from various systems, stored centrally and made available for analysis through a series of smaller warehouses and data marts (see diagram).

Bunch said the first phase of the project, involving the TVA's financial and performance management systems, is due to be completed by next June, although the amount of data that will be stored hasn't been finalized.

Bunch is also using the data warehouse project as an opportunity to borrow a concept from the TVA's nuclear plants, which have to document every system and action.

As part of building the warehouse, Bunch said, she wants to make sure the TVA has a firm grasp of all the interfaces between its systems. Not knowing that information "would never happen in our nuclear facilities, and our goal is that it won't happen anymore with our information systems," she said.

– Michael Meehan

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FRANK HAYES/FRANKLY SPEAKING

Twenty Years After

HAS IT REALLY BEEN 20 YEARS since the PC arrived? Nope. The IBM Personal Computer didn't actually ship until October 1981, so we're still two months shy of its birthday. And desktop computers had already been around for almost seven years by then. Users had even been smuggling Apple IIs into their offices to use VisiCalc, the first spreadsheet software, for two years. So depending on how you define it, the PC was either old hat or yet unborn on Aug. 12, 1981.

That was just the press release date — the day the IBM PC officially became vaporware.

But even though this is a manufactured celebration of an arbitrary anniversary, that doesn't mean something didn't really happen. It just didn't happen exactly 20 years ago.

It happened in the 20 years since.

Remember data processing? That's what we used to do. *Computerworld* even used the term *DPers* to describe its readers. It was the right word. Our job was about data.

The PC changed that.

Not at first. At first, we didn't know what to make of it. It sure wasn't a *real* computer. It wasn't even a minicomputer. It was tiny. It was slow. It even came bundled with a computer game called Microsoft Adventure. Who could take a toy like that seriously?

So if we used it at all, we used it as a glorified terminal.

Users — some users, anyway — knew better.

First, they bought desktop computers out of their own pockets and brought them into the office on the sly, keying data from DP-generated reports into VisiCalc or Lotus 1-2-3. Then, once we began buying PCs for them, they bought their own software, rigged their own networks and did whatever they needed to squeeze usefulness out of these machines.

It wasn't that they were smarter than DPers. It was that they weren't focused on data. They were focused on doing their jobs. And their jobs required both data *and* the ability to massage and manipulate and process it into the information they needed.

In the DP shop, mainframe cycles were expensive, and so was software. On a user's PC, software came out of an inexpensive shrink-wrapped box, and cycles were so cheap that you could waste a whole day's worth of processing and nobody cared.

It took years to get a new application through the DP pipeline and months to get a new report out the door. At a user's desk, maybe it took all day to key in the data, but that spreadsheet could be changed in seconds — and changed again and again until it produced the information a user needed.

PCs did that. Or rather, users were the ones who did that with PCs.

Sure, it could have happened without desktop computers. Eventually. Maybe by now we'd have spreadsheets running under time-sharing, or graphical applications on block-mode terminals.

Naah, get real. We'd have fought against giving users that kind of data access and control. And we'd have fought against the labor-intensive, resource-wasting bells and whistles of graphical software. Not just because we were protecting our turf, but because that sort of thing was peripheral to what we knew was really important: protecting and properly processing the data.

It's taken 20 years, but we *have* learned something from users. We've learned there's more to information technology than processing data. We've learned there's more than one way to use compute cycles — and what makes sense for expensive mainframe cycles is completely wrong for dirt-cheap PC cycles and vice versa. We've learned communication can be as valuable a use for our cycles and networks as data processing.

Who knows? Maybe eventually we'll learn that users are worth the trouble after all.

Yeah, maybe — in another 20 years or so. ▶

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

ERP IMPLEMENTATION pilot fish is explaining how the new software's scheduling function will work. "Once you set up the available equipment, standard run rates, predictable lead times and material requirements, the system will schedule production automatically," fish tells production scheduling manager. Manager retorts, "If I knew all that, I could schedule production too!"

COMPANY HIRES huge payroll service to process – what else? – payroll. But one employee named Null doesn't get her check. "It seems their system is designed to convert any field with a description of 'Null' into blanks," grumbles an IT pilot fish trying to clear up the glitch. "And reporting the problem to their help desk got a big laugh – but no help." In the meantime, fish jokingly suggests Null change her name to something less common – like Void.

NEW PATIENT CARE system has a typical error message when a user types in an incorrect user ID/password combination: "Invalid Signon." Help desk pilot fish doesn't think anything about it until he gets an angry call from a nurse. "The system wouldn't let her sign on," fish says, "and she was not amused at being called an invalid."

HELP DESK pilot fish gets an issue report that consists of just an error screen and a note: "User hit unknown key and this page appeared." Resolution: "Have user hit only the known keys."

IT TAKES 20 minutes for this IT vendor's in-house financial analyst to explain that 80% of the company's customers generate only 20% of the business. He wants to turn this around so 20% of the customers generate 80% of the business. Groans IT pilot fish sitting through the presentation: "And that's his three-year goal."

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The 5th Wave

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"The doctor wants to know if he can perform your endoscopy with a Web Cam for the hospital Web site."

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